

NOVEMBER, 1959

Commercial Fertilizer

and PLANT FOOD INDUSTRY

**TECHNICAL TIPS
FOR BETTER
AMMONIATION**

SEE PAGE 19

GOING GRANULAR?

switch to
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Acclaimed the "BEST" when
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65% of our customers
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C ommenting Freely

by BRUCE MORAN

The Government may be unhappy about the big crops made on the farm this Summer, but the farmer is not. The New York Times made a nation-wide survey of agriculture, and comes up with the statement that "by every yardstick . . . agriculture is in the midst of a boom."

The Agricultural Publishers Association, consisting of the leading farm papers, adds to this "Farm machinery sales for 1959 as a whole are

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expected to be the largest since 1951."

Our own staff-tabulated tonnage reports show fertilizer sales up more than a million and a half tons over the 1957-58 season total.

This 10.5% gain is pleasant to contemplate until we read, state by state, the Land Grant College statements of how much fertilizer is needed to enable the farmer to realize his potential. And that figure is, of course, our potential. An extra million and a half tons is nice, but far from nice enough in view of present population figures, and those which lie ahead.

Speed handling, reduce pile set with Du Pont URAMON® Ammonia Liquors

You can keep production fast-moving and your fertilizer free-flowing with the added conditioning benefits of Du Pont "Uramon" Ammonia Liquors.

UAL helps to prevent the cementing, pile-setting action that often results from some other nitrogen formulations. As mixtures ammoniated with UAL cool, residual moisture combines with the compounds formed—leaving a dry mix remarkably free of excessive caking, segregation and dusting. Result—your UAL goods suffer less pile set, seldom require blasting and can be moved readily by the payloader.

In addition, Du Pont "Uramon" Ammonia Liquors are non-corrosive, can be used in ordinary steel equipment. Secondary set and caking in the bags are also minimized because the urea from UAL is non-reactive with other fertilizer ingredients. And UAL mixtures are highly drillable.

After application, the extra fertilizing bene-

fits of UAL begin. UAL provides nitrogen in both the urea and ammonium form—nitrogen that becomes available at a rate closely paralleling plant requirements. Nitrogen from Du Pont UAL is also leach-resistant; remains in the root zone long after other forms have been exhausted.

Du Pont UAL is available in five forms, including UAL-37 for even more gradual nitrogen release, and UAL-S with the added conditioning effects of ammonium sulfate. For information on which type is best suited to your needs, write Du Pont.

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Over 125 multiwall users last year cashed in on the bag design feature of the 5-Star Packaging Efficiency Plan. In some cases UNION-CAMP artists came up with striking new bag designs which contributed to increased sales. In others they created a family of high-recognition designs for a complete product line. In still others they developed simplified, faster-reading identification prints — resulting in thousands of dollars worth of savings.

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★ BAG DESIGN · BAG CONSTRUCTION · SPECIFICATIONS CONTROL · PACKAGING MACHINERY · PLANT SURVEY

November, 1959

JUST AROUND THE CORNER

By Vernon Mount

A BOOM, rather than a depression would follow the breaking out of peace, thoughtful and competent men believe. They base it on the performance of the economy after World Wars I and II. Then the sharp cut in military spending produced a very much smaller drop in total business, percentagewise.

BUT THE BOOM would not come immediately, they feel. It could take a year - assuming defense spending were cut off suddenly. But in that time there would be a heavy up-surge of primary industrial construction and equipment; lower taxes could leave higher incomes, which - in the American habit - would be spent at once for things about which Americans are now dreaming. So the labor force would be absorbed, and the country would continue its 3% annual rise in personal income, or better.

HOWEVER, don't plan too hard on peace breaking out any time soon. Even if the Russian plan of complete disarmament were to be made practical, the reduction would still have to be gradual - and the whole plan is very doubtful of execution any time soon.

THE MILLENIUM keeps moving away from us!

Yours faithfully,



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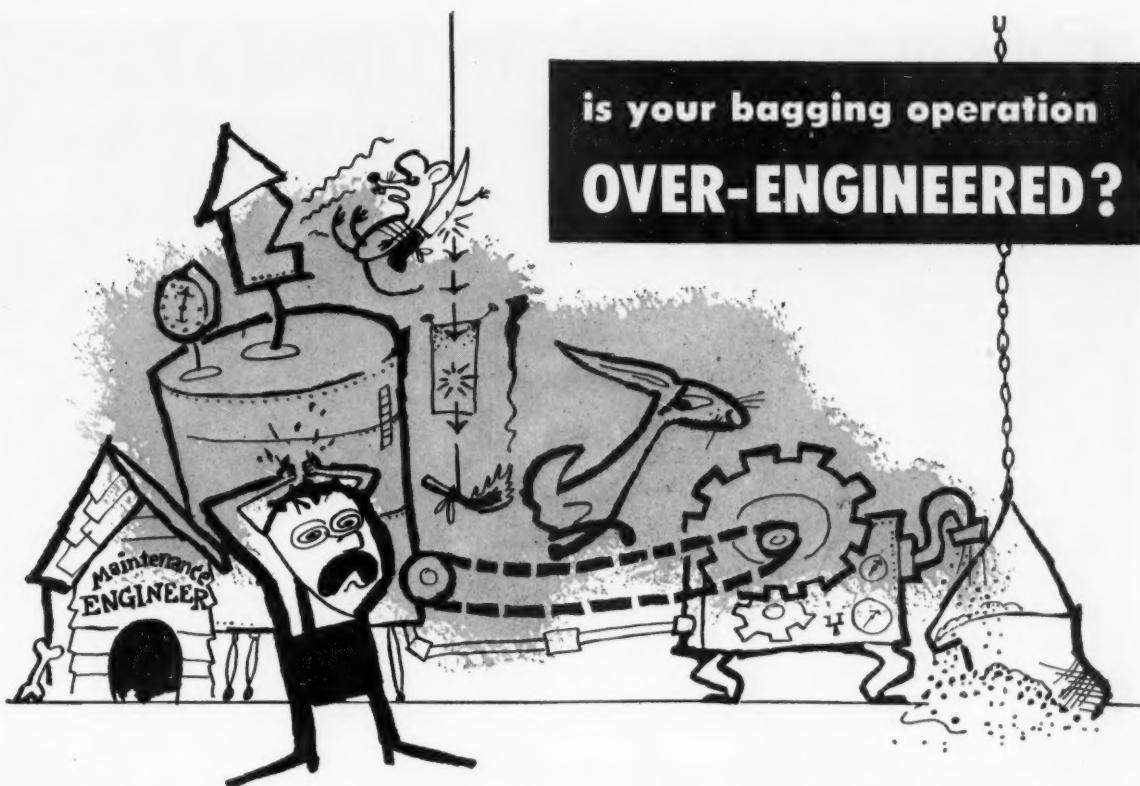
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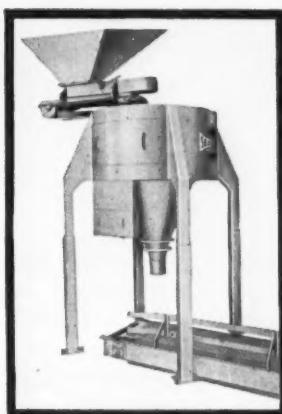


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You need the new **SOUTHLAND PACKER!**

- **IT'S SIMPLE!** Just one scale system—not two or three—fewer moving parts, wearing points.
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Please send me free complete information on the new SOUTHLAND PACKER.

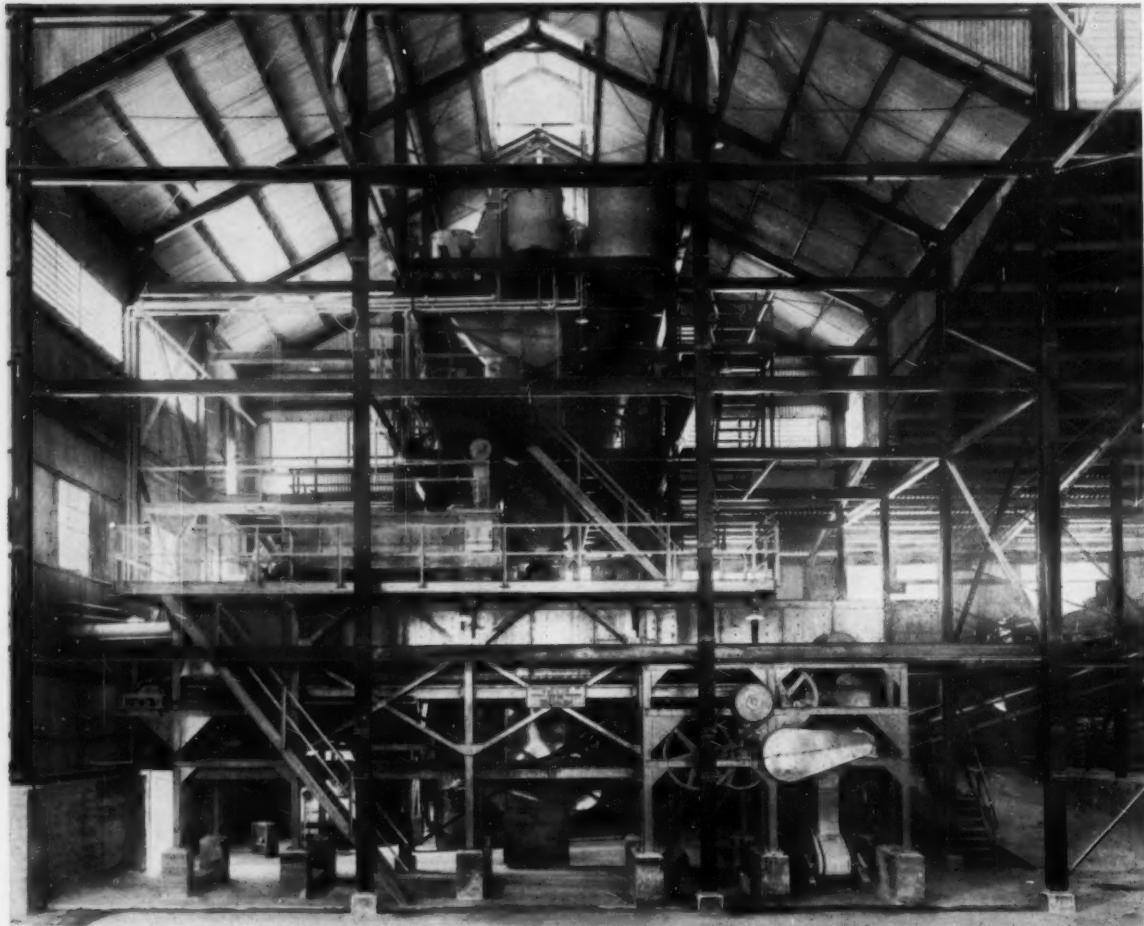
Individual _____

Company _____

Street _____

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... Broadfield Continuous Superphosphate Units

● Users of the Original Broadfield superphosphate plant report High Conversions—20.5% Available P₂O₅ with 7% Moisture from 75% B.P.L. phosphate rock in 14 days or less time.

● Finished product of excellent mechanical condition, and where desired about 50% of output can be of hard granular form, 1/8" 3/16" sizes.

● Output of 10 tons up to 90

tons per hour of Shrunk 20% superphosphate.

● Uses 77-80% or 93-96% sulfuric acid directly into the mixer with no pre-diluting expense.

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● Actual operating records show that maintenance costs are about 5c per ton of su-

perphosphate produced.

● As of this date 116 Original Broadfield plants have been sold throughout the World, and many of these are repeat orders.

● The experience of over 30 years of designing and developing the Broadfield assures the purchaser of the most modern, efficient and low cost superphosphate process and equipment.

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SOHIO's complete line of nitrogen materials gives you the full-range flexibility you need in manufacturing high-analysis finished goods. Choose from a long list of Sohiogen® Solutions, anhydrous and aqua ammonia and Sohigro® Urea to meet your exacting requirements. The "Man from Sohio" will be glad to help you with formulations... and explain how you can benefit from Service at Sohio. Call him soon.

A complete line of Sohio nitrogen products for fertilizer manufacture

Ammonium Nitrate — Ammonia Solutions

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Sohiogen 4122
Sohiogen 4526
Sohiogen 4730
Sohiogen 4126
Sohiogen 4934

Old-line and con-
centrated solutions
for both conven-
tional and granula-
tion use

Urea — Ammonium Nitrate — Ammonia Solutions

Sohiogen 4119
Sohiogen 4320
Sohiogen 4422
Sohiogen 4425
Sohiogen 4428
Sohiogen 4933

Ammonium nitrate
nitrogen solutions
containing 6 to 15%
urea to:
1. lower salting out
temperatures of
solutions
2. improve granu-
lation
3. help condition
mixed goods

Urea — Ammonia Solutions

Sohiogen 2104
Sohiogen 4531
Sohiogen 4537

Urea and ammonia
in 45% nitrogen
solutions, winter
and summer grades,
and high urea con-
tent solutions for
liquid fertilizer
manufacture

Urea — Ammonium Nitrate Solutions

Sohiogen 2800
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28 and 32% nitro-
gen solutions con-
taining no free am-
monia — ideal for
surface and sub-
surface application
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in complete liquid
fertilizers

Anhydrous and Aqua Ammonia

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18-59



How and why..

WONDERWALL, West Virginia's new multiwall bag made with Kraftsman Clupak paper, is inspected by industry leader Robert S. Gerstell, President, Alpha Portland Cement Company, Easton, Pa. "This isn't the first time we've introduced revolutionary advances for the sake of better operations in our plants . . . and for our ultimate customers," Mr. Gerstell states.

...ALPHA CEMENT changed to multiwalls of West Virginia's Clupak* Paper

When the new tougher Craftsman Clupak paper was being introduced by West Virginia Pulp and Paper Co., the Alpha Portland Cement Co., Easton, Pa., major producer of Portland and mortar cements, did its own testing.

This was only natural for a leading company in the industry—with eight plants in the East, Midwest and South. Alpha's president, Robert S. Gerstell, foresaw the tremendous possibilities of Craftsman Clupak paper, especially in terms of customer satisfaction and operating economy. With his guidance, Alpha was the first major cement company fully to realize the potentials of this new West Virginia paper!

Alpha's purchasing agent, James I. Maguire, directed the test program which compared Alpha's then current, natural kraft multiwalls with bags made of the new Craftsman Clupak, the paper with built-in stretch.

Filling, handling and shipping were all examined. On every count, the new Craftsman Clupak paper bag proved its superior toughness!

Construction of the natural kraft bags, to carry 94# of Portland cement, was 2/40, 2/50 totalling 180# paper basis weight. The new Craftsman Clupak bags

were 1/50, 1/50, 1/50 totalling 150# paper basis weight. Savings on the paper basis weight reduction of 30# amounted to \$2.75 per M bags.

But more important—bag breakage in shipments of both Portland and mortar cement has become negligible! And complaints from supply dealers have been reduced to a minimum.

Today, virtually all multiwalls used by Alpha, from whatever supplier, are made of Craftsman Clupak paper. And naturally, Alpha is using West Virginia's own bag, called WONDERWALL.

If you pack fertilizer, feed, cement, flour, chemicals or like products, see how you can *cut costs* and satisfy customers *better* with WONDERWALL. Write Multiwall Bag Division, West Virginia Pulp and Paper Company, 230 Park Avenue, New York 17, N. Y.



West Virginia Pulp and Paper

*Clupak, Inc.'s trademark for extensible paper manufactured under its authority.



TEST MASTER. James I. Maguire, purchasing agent of Alpha Portland Cement Company, says: "The success of bags made from Craftsman Clupak paper, due to sheer toughness, was extraordinary from the start. They are not only tougher . . . they make possible realistic savings in bag costs."



WONDERWALL PROVING GROUND #1. Actual handling of WONDERWALLS and other bags made with Craftsman Clupak paper—in comparison with the old, natural kraft multiwalls—proves the superiority of Craftsman Clupak paper. No problems with filling, opening, stacking or shipping.

BAY-SOL[®] NITROGEN SOLUTIONS ANHYDROUS AMMONIA

AMMO-NITE[®] AMMONIUM NITRATE FERTILIZER — 33.5% NITROGEN

More in service, more in quality!

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Modern, easily accessible manufacturing plant and continuing research.

Conveniently located service offices.

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BRANCH OFFICES: Norfolk, Va., Charleston, S. C., Tampa, Fla., Jackson, Miss., Montgomery, Ala., Columbus, Ohio, Des Moines, Iowa.



180 tons of pelletized and powdered fertilizer moved each hour in Blaw-Knox Clamshell Buckets

Olin Mathieson Chemical Corporation uses eight Blaw-Knox Clamshell Buckets in transferring fertilizers from ship to warehouse at Baltimore, Maryland. The Blaw-Knox Clamshells are also used for a wide variety of re-handling operations at the warehouse.

Beside the ability to deliver sustained high output, the two-line, lever arm buckets handle pelletized fertilizer with minimum degradation of the pellets. Maintenance has been limited to routine checkouts and lubrication.

Performance such as this has earned a preferred status for Blaw-Knox Clamshell Buckets throughout industry. Backed by expert application engineering service, a Blaw-Knox Clamshell Bucket is one way to improve the efficiency of your handling operations.



2½-cubic-yard Blaw-Knox Clamshell Bucket transferring fertilizer from ship to dockside cars. These units are described in Blaw-Knox Bulletin 2378-R-1. Write for a copy today.

BLAW-KNOX COMPANY

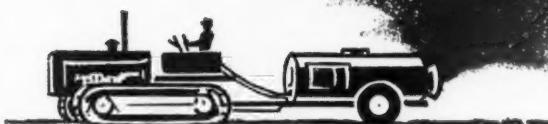
Blaw-Knox Equipment Division
Pittsburgh 38, Pennsylvania



The Versatile Fungicide



TRI-BASIC COPPER



Is there another Fungicide offering these advantages?

You get so many more advantages with Copper fungicides — used as a spray or dust on practically all truck crops in the control of persistent fungus diseases — Tri-Basic provides control of citrus and grape diseases, also on many deciduous fruits — Tri-Basic has excellent adherence qualities and protects longer — lower disease control cost, greater yield of top quality produce.

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- Easy to Apply
- Economical
- Upgrades Quality of Fruits & Vegetables
- Longer Shelf Life
- Corrects Copper Deficiencies
- Effective Control
- Always Dependable
- Compatible
- Plentiful Supply

TRI-BASIC COPPER SULFATE Quality Controlled from Mine to Finished Product

For further information
please make requests on
your company's letterhead.





Here are two examples of recent developments by Spencer's Technical Department. Photo above shows tank cars of new SPENSOL 440 that withstood temperatures to -17° F. without salting out. Photo at right shows equipment used by Spencer to perfect an improved preneutralization process.



How the results of
Spencer Technical Department research
can help you . . .

Save Up To \$5.00 A Ton...And Make Even Better Mixed Fertilizer:

You can make important savings in your production costs and improve your finished fertilizer products by taking advantage of the continuing research conducted by Spencer's Technical Department. Working in the laboratory and in a special mixed fertilizer demonstration plant, Spencer technicians have already perfected improved nitrogen solutions and have developed a number of mixing innovations. Here are some examples:

A pair of new SPENSOL GREEEN Nitrogen Solutions (430 and 440) make it possible for you to save as much as \$1.97 per ton on sulfuric

acid and P.O. requirements. New SPENSOL GREEEN is less corrosive, too, and new SPENSOL 440 will remain fluid at temperatures as low as -17° F.

An additional saving of as much as \$5.00 a ton can be made by using the preneutralization process improved by Spencer's Technical Department. This process lets you produce up to 20% nitrogen fertilizer without using dry nitrogen. Spencer's Technical Service team has already helped many companies in the planning, installation and operation of preneutralization.

Better distribution of liquids in dry materials is now possible because of the new Spencer Sparger. Built without pipes or holes, this new kind of sparger can give you more on-grade material, cut corrosion and reduce air pollution.

It's easy to put Spencer's Technical Department to work for you. Simply contact your Spencer sales representative, your Spencer Tech Service man, or write direct to Spencer Chemical Company.



America's Growing Name In Chemicals

General Offices: Dwight Bldg., Kansas City 5, Mo. District Sales Offices: Atlanta, Ga.; Chicago, Ill.; Memphis, Tenn.; Omaha, Nebr.; Kansas City, Mo. Works: Pittsburg, Kans.; Henderson, Ky.; Vicksburg, Miss.

Insist on SPENSOL GREEEN (Spensol Nitrogen Solutions)

IT ALL COMES DOWN TO THIS CRITICAL POINT



...the core where ground phosphate rock and phosphoric acid meet to make Trebo-Phos*, the triple superphosphate with controlled porosity for proper ammoniation. American Cyanamid Company, Agricultural Division, New York 20, New York. *Trebo-Phos is American Cyanamid Company's trademark for its triple superphosphate.

CYANAMID SERVES THE MAN WHO MAKES A BUSINESS OF AGRICULTURE





THIS symbol stands for high-grade uniform, coarse and granular Muriate of Potash (60% K₂O minimum). Southwest Potash Corporation provides a dependable supply of HIGH-K* Muriate for the plant food industry.

* Trade Mark

**Southwest Potash
Corporation**

RESEARCH

RESULTS & REPORTS

P Lack Influences Winterkill

High N without adequate P will, over a period of years, increase the hazards of winterkill of Coastal Bermudagrass, according to USDA's research in cooperation with the Georgia AES.

Phosphate Placement Advice from Michigan

Research at the Michigan AES reveals that phosphate fertilizers that are more than 40% water soluble help plants more if they are placed in a band along plant row. The less soluble varieties do better when broadcast and mixed with the soil.

Desalting of Sea Water

The Department of Interior, which has been working for some time on the falling water-table problem, has now gotten to the definite engineering stage for several desalting demonstration operations. All are slated for operation next year.

De-sexing Ends Screw-Worms

About a year ago we reported here that the screw-worm was being sterilized by exposure to radioactive cobalt. This was good news for cattlemen, bad news for the screw-worm.

It worked. No screw-worms have been reported in Georgia, South Carolina or Alabama this year—and the Sebring lab of USDA is being closed with a job well done.

Raspberries Respond to Potash Application

Correcting the potash deficiency in black raspberries resulted in 20% more fruit, 25% more canes and 100% increase in the weight of dormant prunings which reflect improved vegetative growth of the planting as a result of the treatment, says New York's Cornell AES.

CCC Opposite of Gibberellic

A relatively cheap chemical has been researched at Michigan State and found to be the opposite of Gibberellic Acid in its effect on plants—making stems short, bushy. It is called CCC, and is about to (Concluded on page 68)

Arcadian® News

Volume 4

For Manufacturers of Mixed Fertilizers

Number 11

Technical Tips for Better Ammoniation

THE RIGHT COMBINATION TO MEET FORMULA NEEDS

Whether you produce low-analysis or high-analysis fertilizers in pulverized, granular, or semi-granular form, you have many different ARCADIAN® Nitrogen Solutions from which to select those best suited to your ammoniation needs.

Making the most advantageous selection is not always a simple matter. It can be a perplexing problem to choose the right combination of solutions and other ingredients to produce the weights and plant food ratios that are desired,

and to control moisture and keep costs down.

This is true even in the production of fertilizer from which moisture is not to be removed. It becomes an even more complicated problem as the analyses are raised and when moisture is to be removed, as in granulation . . . or, held to a low level, as in semi-granulation.

The table below shows how such problems are solved, using three different NITRANA Solutions as examples. Many other combinations and complexes

are obtainable with these and other ARCADIAN Nitrogen Solutions.

The table shows how to get a specific ratio of nitrogen to phosphoric acid within definite weight limits. Three different NITRANA Solutions are shown combined with superphosphates and sulphuric and phosphoric acids. For efficient use of this table, you can find the pounds of neutralizing ammonia per unit of nitrogen in each Solution listed on the back page of this issue of The ARCADIAN News.

The formulation you need may demand the maximum of 20% superphosphate for its low cost P₂O₅ combined with its ability to react with much ammonia thereby also holding the cost of nitrogen to a low point in the formula. A considerable amount of phosphoric acid may be justified for its economy of weight in total plant food when reacted with nitrogen solutions.

The table shows that supplying one unit of P₂O₅ with 20% superphosphate

(Continued on following page)

MATERIALS COMBINED AMMONIATION RATES	BASED ON ONE UNIT	NITRANA 2				NITRANA 2M				NITRANA 3			
		TOTAL LBS. PRODUCT	% N	% P ₂ O ₅	TOTAL %	TOTAL LBS. PRODUCT	% N	% P ₂ O ₅	TOTAL %	TOTAL LBS. PRODUCT	% N	% P ₂ O ₅	TOTAL %
Superphosphate 20% 6.0% H ₂ O 6.0 lbs. NH ₃ /Unit P ₂ O ₅ *WET TOTALS DRY TOTALS	P ₂ O ₅	127.0 117.5	8.7 9.4	15.8 17.0	24.5 26.4	125.2 117.5	8.8 9.4	15.9 17.0	24.7 26.4	122.8 112.6	7.6 8.3	16.3 17.8	23.9 26.1
Triple Super. 47% 3.0% H ₂ O 3.0 lbs. NH ₃ /Unit P ₂ O ₅ *WET TOTALS DRY TOTALS	P ₂ O ₅	56.1 53.1	9.9 10.4	35.6 37.7	45.5 48.1	55.2 53.1	10.0 10.4	36.2 37.7	46.2 48.1	54.0 50.6	8.7 9.2	37.0 39.5	45.7 48.7
Sulphuric Acid 66° Be 93.19% Acid 3.1 lbs. Acid/lb. NH ₃ *WET TOTALS DRY TOTALS	N	82.2 73.6	24.3 27.2	0.0 0.0	24.3 27.2	78.9 73.6	25.3 27.2	0.0 0.0	25.3 27.2	88.5 76.9	22.6 26.0	0.0 0.0	22.6 26.0
Phosphoric Acid 75% Acid 54.3% P ₂ O ₅ 7.2 lbs. NH ₃ /Unit P ₂ O ₅ *WET TOTALS DRY TOTALS	P ₂ O ₅	69.2 55.9	19.2 23.8	28.9 35.8	48.1 59.6	67.1 55.9	19.8 23.8	29.8 35.8	49.6 59.6	64.2 50.0	17.4 22.4	31.2 40.0	58.6 62.4

* INCLUDES WATER IN ALL MATERIALS

neutralized with 6 pounds of ammonia from NITRANA 2M adds about 117.5 pounds dry weight. The product should analyze about 9.4% N and 17% P₂O₅ and have a total of 26.4% plant food. Ratio of N to P₂O₅ would be about 1 to 1.81.

A great increase in plant food concentration results when one unit of P₂O₅ is supplied by 75% phosphoric acid (54.3% P₂O₅) and this acid is neutralized with 7.2 pounds of ammonia from NITRANA 3. Only about 50 pounds dry weight is involved and the product would analyze about 22.4% N, 40% P₂O₅ and 62.4% total plant food. Ratio of N to P₂O₅ would be about 1 to 1.79.

Further flexibility in economy, heats generated, concentration of plant foods, and influence on condition for desired effects are achieved in using triple superphosphate or sulphuric acid for neutralizing the ammonia.

Heat of ammoniation varies greatly

with different materials, as shown below. The proper amount of heat aids moisture removal and granulation. To raise one ton of fertilizer 1°F., requires 500 B.T.U.'s. Evaporation of one pound of water absorbs about 1040 B.T.U.'s, which would cool a ton of fertilizer about 2°F.

Heat Generated by Reacting Ammonia

Material	B.T.U.'s of Heat per Pound of Ammonia
Superphosphate 20% P ₂ O ₅	1460
Triple Superphosphate	1540
Phosphoric Acid	1900
Sulphuric Acid	2940

Nitrogen Division Technical Service is always ready to help you with specific ammoniation and formulation problems. Write Technical Service, Nitrogen Division, Allied Chemical, 40 Rector Street, New York 6, N.Y.

takes place at night, make certain that the area around the car is well lighted, so that switching crews can see that the tank car is connected.

After unloading, make sure that the tank car is completely disconnected and ready to go before telling the switch crew to pull it out. It's no easy matter to close valves on a tank car while a hose under 40 to 50 lbs. pressure is whipping about, spraying solution.

No. 2—Safety in Production Equipment

Failure of plant equipment is another source of danger. The entire solution system should be constructed of the best materials available. It pays to follow the solution supplier's recommendations to the letter—and then assume a real possibility of failure. With this attitude, a plant's preventive maintenance program becomes an accident prevention program as well.

Care should be exercised when choosing equipment. For example, carbon steel is often used for solutions handling systems. This is not good practice. There are other materials, readily available, that are much more satisfactory. These include: aluminum and most aluminum alloys, including 5052, 5154, and 6061; stainless steels including Types 304, and 316; and rubber, Neoprene, polyethylene, vinyl resins and glass. Among the materials destroyed rapidly, and to be avoided under all circumstances are: copper, brass, bronze, Monel, zinc, galvanized metals, conventional die castings, concrete, and most alloys that contain any of the above materials.

When nitrogen solutions evaporate, they leave a salt residue. It is important, therefore, to pick valves, such as pressure relief valves, that will operate even though they contain salt deposit. Indeed, pressure relief valves should be operated periodically, to make sure they are functioning.

It is important to consider the materials from which valves and fittings are made. For example, aluminum will not stand the physical abuse that carbon steel and stainless steel can. So, in aluminum installations, it is best to locate stainless steel valves at critical points, such as on storage tanks. Wherever a line will be connected and disconnected quite often, stainless steel threaded connections should be used.

Where there are diaphragm type valves, inspect and replace diaphragms regularly. This helps avoid the hazard of replacing a ruptured diaphragm while the system is full of solution and under pressure. Unloading hoses should have bleed valves, or the system designed so that the operator can safely bleed off pressure before disconnecting.

It never pays to skimp on hose—for

PRECAUTIONS FOR HANDLING NITROGEN SOLUTIONS

Accidents that occur during the handling of nitrogen solutions are usually the result of taking short cuts in procedure, carelessness, or lack of knowledge of certain characteristics of nitrogen solutions. Specifically, there are *four areas* where plant management should concern itself with the establishment and strict enforcement of safe practices.

No. 1—Personal Safety Equipment

Most nitrogen solution plants provide their operators with protective equipment, but, unfortunately, do not make sure that it is used. Regular inspections of safety equipment and its use should be instituted, and the employee should be made responsible for the condition of this equipment.

Nitrogen solutions do not have the strong caustic properties of some of the other materials handled in fertilizer plants, such as sulphuric acid or anhydrous ammonia. However, an operator should be provided with a good set of goggles or a full-face mask if he works in an area where gauge or rotometer glasses might break, or a line might rupture.

Connecting and disconnecting tank cars is a job that demands adequate personal safety equipment. Here, the men are working in a rather limited space, high above the ground, with limited opportunity for emergency exit. Obviously, proper safety equipment should be provided for two reasons: first, of course, as protection against contact with the

solution; second, to prevent panic which may result in a fall causing injuries more serious than those brought about by contact with the solution. This equipment includes: full-face gas masks with speaking diaphragms, gauntlet-type chemical-resistant gloves, and a chemical-resistant apron. A long sleeve cotton shirt is recommended to cut down exposed skin area.

Gas-mask canisters should be replaced periodically, even though they may not have been used in an ammonia atmosphere. These canisters carry a date which should be respected. Even an experienced man could panic if he found that the gas mask he trusted had suddenly filled up with ammonia gas.

Plant managers would do well to insist that connection and disconnection of tank cars be handled by two men—one to do the job and the other to stand by to give aid in an emergency. For example, when connecting a tank car, the safety man should be stationed on the ground with a fire hose. In the event of a broken connection, he would be able to direct a stream of water on it immediately, to minimize the danger.

Needless to say, steps should be taken to see that tank cars are not disturbed once hose connections have been made. Place a "tank-car-connected" sign and a derail device ahead of the car. Make sure car brakes are set. When the car is not actually being unloaded, don't allow hoses to remain connected or valves on the car to remain open. If unloading



Ask Nitrogen Division for Technical Help

To provide customers with competent, well-qualified technical assistance, Nitrogen Division, Allied Chemical Corporation, maintains the largest, best-trained, most-experienced staff of fertilizer technologists in the industry. These men are ready, willing and able to help you find the practical answer to your formulation, ammoniation and manufacturing problems. They are skilled in ferreting out trouble spots and in helping you to correct operating techniques. Their services are available to customers without charge. Call Nitrogen Division, 40 Rector Street, New York 6, N. Y. HAnover 2-7300.

hoses undergo rough handling, deterioration and high pressures. Where a plant is using high pressure nitrogen solutions, it would be well to consider anhydrous ammonia hose. However, regardless of the type used—and in the absence of hydrostatic testing—all hoses should be replaced periodically, for it is difficult to see a weak place or break with normal inspection.

No. 3—Safety in Repairs and Salvage

The area of repair and salvage has even greater potential hazard than exists in routine production procedures. For example, a very dangerous repair practice is the use of a welding or cutting torch on equipment, particularly steel, that has been in nitrogen solution service.

In an actual case, an operator attempted to make a repair weld on the outside of a steel storage tank that had a leak in its upper portion. Shortly after he started, the tank began to heat up further away from the weld area than would normally be expected. Then the pressure relief valve opened, allowing dense fumes to escape. The local fire department was called. By the time they arrived and put a stream of water on the tank, it had gotten red hot above the solution level. Whether it was due to the cooling effect of the water or the

material in the tank burning itself out, the heat gradually subsided, and no explosion occurred.

Now here is what caused this dangerous situation. As solution was used and the level in the tank dropped, solution clinging to the sides of the vessel evaporated, causing ammonium nitrate to be deposited. As fertilizer producers know, sufficient heat will cause ammonium nitrate to decompose in a self-sustaining reaction. Decomposition itself is a relatively slow reaction but the fumes evolved can soon build up tremendous pressure, particularly if confined in a limited space. Since ammonium nitrate does have a self-sustaining decomposition and a separate oxygen supply is not required, it is impossible to smother this type reaction. The only way to stop it is to cool the ammonium nitrate adjacent to the decomposing ammonium nitrate to a point where the heat supplied will not be sufficient to raise the unreacting ammonium nitrate to its decomposition point.

Another case involved an abandoned steel pipe that had been in solution service. All of the pipe had been taken down, with the exception of a 25-foot length hanging along an unloading platform. An air line ran just below this pipe. Years later, in the winter, the air line froze. Attempting to thaw it, a laborer ignited a bucket of waste and set it under the air line. Unfortunately the aban-

doned solution line ran right through the flame. Shortly thereafter, a terrific explosion occurred. Part of the unloading platform was torn out and flying steel severed a hose lying 150 feet away. Luckily, no one was in the area at the time.

Several safe operating practices should be apparent from the foregoing. First of all, never apply heat to thaw or repair any equipment used for handling nitrogen solutions if it can possibly be avoided. Occasionally a steel tank may spring a leak which may be fixed by welding. However, if a steel tank has corroded that much in one spot, the chances are that it would be unsuitable for use even after patching. If it is necessary to weld a tank—and even aluminum tanks sometimes need welding—the tank should be completely emptied of all materials and thoroughly washed with water until free from ammonia fumes. When it is safe for a man to enter the tank, have him use wire brush, chipping hammer and water to clean a large area where the weld is to be made. If, during the welding, any indication is given of the possible decomposition of ammonium nitrate, flood the entire area with water immediately to cool it down. Always keep men outside the tank to assist the welder. Have a harness around the welder's waist so that he can be pulled out if necessary. Have extra help nearby to remove the man quickly.

Under no circumstances should open flames or other sources of high localized heats be used to thaw nitrogen solution pipe lines. Use hot water. As for welding pipe, it's difficult to think of a situation where the cost saved by repairing a bad pipe line can be justified by the risk involved.

New fertilizer manufacturing techniques have brought about an increased use of sulphuric acid in the fertilizer mixer. Occasionally, because of the convenience of such an arrangement, equipment will be installed with the sulphuric acid and nitrogen solution systems connected. This can be an unsafe practice. Some situations may appear to be harmless, but there are many possibilities for dangerous arrangements: viz. connecting the vent pipes of acid and solution tanks together to economize on safety valves and piping.

When laying out systems such as these where a potential hazard may exist, you cannot be too careful. For example, even batch tanks, with their exposed gauge glasses, are a source of potential danger. Protect gauge glasses with shatter-proof glass or plastic guards. It's wisest to use integrating type meters of stainless steel. These are entirely suitable for batch type operations, and are available today at relatively low cost.

Another design defect is the absence of pressure relief valves in anhydrous

(Continued on following page)

(Continued from preceding page)

ammonia pipe lines. Because the coefficient of expansion of liquid ammonia is so high, it is essential to locate a pressure relief valve at any place in an anhydrous ammonia system where there is a possibility of trapping liquid ammonia between two closed valves.

No. 4—On-the-Spot Emergency Aid

Plant management should see to it that emergency showers are installed in

operating areas. Make sure that this equipment is usable throughout the year and does not have to be turned off during freezing weather. Men working in close proximity to nitrogen solutions, anhydrous ammonia and acids have the right to expect emergency aid near at hand if the need arises. See that they have it!

To sum up the case for safety—nearly all the liquid materials used in fertilizer

manufacturing operations can be *hazardous* materials. So, look over your plant layout. Make modifications to minimize or avoid these hazards. Install safety equipment. Instruct your operators on how to handle these materials properly. Give them the necessary protective equipment . . . and insist that they use it. Then assume that there *will* be accidents and provide emergency treatment facilities in the area, so that aid can be administered promptly.

Arcadian® NITROGEN SOLUTIONS

	CHEMICAL COMPOSITION %					Neutralizing Ammonia Per Unit of Total N (lbs.)	PHYSICAL PROPERTIES		
	Total Nitrogen	Anhydrous Ammonia	Ammonium Nitrate	Urea	Water		Approx. Sp. Grav. at 60°F	Approx. Vap. Press. at 104°F per Sq. In. Gauge	Approx. Temp. at Which Salt Begins to Crystallize °F
NITRANA™									
2	41.0	22.2	65.0	—	12.8	10.8	1.137	10	21
2M	44.0	23.8	69.8	—	6.4	10.8	1.147	18	15
3	41.0	26.3	55.5	—	18.2	12.8	1.079	17	-25
3M	44.0	28.0	60.0	—	12.0	12.7	1.083	25	-36
3MC	47.0	29.7	64.5	—	5.8	12.6	1.089	34	-30
4	37.0	16.6	66.8	—	16.6	8.9	1.184	1	56
4M	41.0	19.0	72.5	—	8.5	9.2	1.194	7	61
6	49.0	34.0	60.0	—	6.0	13.9	1.050	48	-52
7	45.0	25.3	69.2	—	5.5	11.2	1.134	22	1
URANA™									
6C	43.0	20.0	68.0	6.0	6.0	9.3	1.180	12	39
6M	44.0	22.0	66.0	6.0	6.0	10.0	1.158	17	14
10	44.4	24.5	56.0	10.0	9.5	11.0	1.114	22	-15
11	41.0	19.0	58.0	11.0	12.0	9.2	1.162	10	7
12	44.4	26.0	50.0	12.0	12.0	11.7	1.087	25	-7
13	49.0	33.0	45.1	13.0	8.9	13.5	1.033	51	-17
15	44.0	28.0	40.0	15.0	17.0	12.7	1.052	29	1
U-A-S™									
A	45.4	36.8	—	32.5	30.7	16.2	0.932	57	16
B	45.3	30.6	—	43.1	26.3	13.5	0.978	48	46
Anhydrous Ammonia	82.2	99.9	—	—	—	24.3	0.618	211	-108

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WHY FERTILIZER?

"I use chemical fertilizers because it pays me to do so and my constant endeavor is to use the optimum amount which, in my belief, is synonymous with maximum profitability."

That declaration was made by a successful commercial farmer before a group of fertilizer manufacturers. He is one who has a technical background, whose family has been active in truck farming for several generations and apparently knows what it takes to stay in business. Profit is his motivation.

Let's examine what some others have described as their concept of fertilization. Here is what Dr. E. M. Crowther, late Director of Rothamsted Agricultural Experiment Station said.

"Fertilizers are often discussed as an aid to maintaining soil fertility, but an even more important function is to raise soil fertility sufficiently to allow better kinds of crops to be grown profitably in new and more productive systems of agriculture." This eminent scientist also has profit in mind even though he emphasizes the soil fertility build-up approach to profit and the need today to raise the fertility level to enable new and better varieties of plants to produce to their higher capacities. "The more productive systems of agriculture" referred to consider fertilizer as an indispensable factor with proper soil management practices in the realization of profitable farming.

German scientists have devoted much study to the problems of food production on the limited cropland of their country. Intensive systems of farming are the rule in Germany. It is interesting therefore to note what one of their foremost representatives, Adolf Mayer, had to say on this subject Dr. Mayer pointed out in all his teachings that fertilization had a dual purpose: to fertilize the soil and the crop. By this, he meant that it was necessary to build up and maintain a high level of fertility in the soil at all times in addition to supplying the crop with its needed nutrients. This advice should be taken to heart by all who have to do with profitable agricul-

by
Vincent Sauchelli
Chemical Technologist
National Plant Food Institute

ture.

Now, let's see what a prominent American soil scientist and farmer has to say on this subject. Dr. George E. Smith of the Missouri Agricultural Experiment Station is recognized as one of our best authorities on the theory and use of fertilizers. In the application of fertilizers, says Dr. Smith, the purpose is changing from that of applying a certain quantity of mixed fertilizer which returned a greater value than its cost to that of removing soil fertility as a factor in production. Except for the cost of fertilizer it costs but little more to bring a two bale per acre cotton crop to time of harvest than a 300 pounds of lint crop; or a 100-bushel per-acre corn crop than a 60-bushel crop. Dr. Smith is referring to the practice of so many farmers in the country who apply a minimum amount of fertilizer, just enough to produce a low average yield and who miss the profit potential in applying the maximum amount.

You may have heard the question: Does a farmer use more fertilizer so as to make more profit per acre or because he already is making enough profit per acre to enable him to do so? Which is cause and which effect? This can become a vicious circle, as which came first, the chicken or the egg? Numerous studies have been published on this question based on surveys and statistical techniques. The industry would surely like to know the right answer. Mr. A. L. Mehring, formerly with the USDA, published several years ago an elaborately derived formula which purported to forecast fertilizer consumption. It was based on the concept that the amount of fertilizer purchased tended to follow the farmers' gross income for the previous year. Perhaps his reasoning was true when the tobacco and cotton crops dominated the farm situation. Conditions have changed and that Mehring formula no longer applies. Farmers today are more of the industrial type who are conscious of the fact that unit cost of pro-

duction is a function of the yield. Higher rates of expenditure on fertilizers raise the profitability level. If it were true that a farmer uses only that amount of fertilizer which his past year's profit enabled him to afford, it would be a dismal situation. Fortunately, the majority of those farmers who constitute the bulk of fertilizer consumers seem to spend on fertilizers a certain percentage of their income regardless of relationship to a previous year profit level.

Surveys conducted by NPFI and other agencies show that on 100-acre farms and bigger, the crop yields and the net profit per acre are consistently higher where the rate of fertilizer application is higher. Of course, there is a limit to this relationship between fertilizer increments applied and profit returned; the greatest return per acre is at that point where the last increment of fertilizer just pays for itself. This maximum level of per acre profit is only too rarely realized by most farmers. Time and education will, it is hoped, increase the number that do.

NPFI Holds Tour for Farm Managers and Bankers

In cooperation with the University of California, NPFI early last month staged a tour and school for 50 professional farm managers and bankers. After a showing of the "What's in the bag" NPFI color film, and talks by Dr. W. E. Martin, Dr. B. Krantz and Dr. R. L. Branstrom—all UC extension soil specialists, the group went on tour.

The trip, in this sequence, included Stauffer and Calspray at Richmond; Hercules Powder; Shell Chemical at Pittsburg; Western States, Nichols; and concluded with a dinner at Berkeley, compliments of NPFI. The program wound up with comments by U of C Dean Aldrich, a showing of "Cash in on Grass" another NPFI film, and a talk on the economics of fertilizer use by Dr. Chester McCorkle of U of C-Davis.

Dr. Richard B. Bahme, NPFI regional director, planned the program and was a major factor in its execution.

Getting Down to Brass Tacks in FORESTRY

SOUTHEAST

GEORGIA PINE

There is under way in Georgia what is said to be the first experiment on tree fertilization ever run on all three objectives: the effect of fertilization on gum yield, tree growth and cone production. The program is cooperative. Arthur G. Steedley, who sparked it, is handling general supervision. The soil samples were taken by Carter Martin, County Agent, and run by a soils laboratory of the University of Georgia. The fertilizer is supplied by Nitrogen Division of Allied Chemical.

This man Steedley, who is Area Forester, US Forest Service, has a special interest in pine plantations in the Coastal Plain of Georgia. He is the man who advises owners of 15-year or older slash pine to (1) mark trees to be removed at next thinning (2) turpentine those marked trees for 3 years (3) cut the trees for pulp, poles, posts or lumber (4) re-mark and repeat the operation until the remaining trees reach maturity for the best market available at the time. This is good advice, because it gives the farmer current income from his trees, better growth because of thinning.

In friendly talks with Nitrogen Division's Leroy Tippens—who once worked with Mr. Steedley, the thought of fertilizing a well-managed slash pine plantation came up. It had been established by the Southeastern Forest Experiment Station at Lake City, Florida, that fertilizer increased gum yields 23% and tree growth 36.6%, and a demonstration on a large scale would further prove this point. A group representing the Experiment Station and Nitrogen Division came up with the program now under way.

The plantation owned by J. T. Coffee and located near Eastman, Georgia is divided into 25 half-acre plots. 6-12-12 and a 19% N solution, Feran are being used, and were applied in February of this year. There are five treatments, each of which has been applied to five plots:

As has been inferred in previous articles we have published here, the US is beginning to catch up with Europe, and with Germany in particular in the matter of fertilizing standing forests. Here are reports from the Southeast, the Southwest and the Far West, all of which contribute much to the subject.

1. No fertilizer
2. 500 lbs. per acre of 6-12-12 (30N-60 P-60K)
3. 500 lbs. per acre 6-12-12, plus 120 lbs. of N (150 N - 60 P - 60 K)
4. No 6-12-12. 30 lbs. Nitrogen (30 N only)
5. No 6-12-12. 150 pounds Nitrogen (150 N only)

The plantation trees are an 18-year-old stand of vigorously growing slash pines large enough to be tapped for gum. Trees have been marked, staked and buckets attached on part of the stand, as the pictures show.

Involved in the operation, in ad-

FORESTRY GRANTS

The National Plant Food Institute has awarded eight grants-in-aid for research in the fertilization of forest trees, Dr. Samuel L. Tisdale, Southeastern Regional Director of the Institute, announces.

Organizations receiving financial assistance, the project leaders responsible, and the aims of the studies are as follows:

Duke University, Durham, North Carolina, Dr. C. W. Ralston, evaluating shortleaf pine growth response to varying levels of N, P, and K.

U. S. Forest Service, Union, South Carolina, Dr. L. J. Metz, establishing needle analysis techniques for assessing nutrient contents of forest soils.

Southeastern Tidewater Experiment Station, U. S. Department of Agriculture, Fleming, Ga., George Sparrow, determining survival and growth responses to the interaction of drainage, irrigation, and fertilization of loblolly and slash pines.

Mississippi State University, Starkville, Mississippi, Drs. George Switzer and Lyle Nelson, determining the time, frequency, and optimi-

dation to Mr. Steedley, Mr. Martin and Mr. Tippens are these: Forest Service and its Southeastern Forest Experiment Station—John W. Cooper, T. F. McLintoch, Larry Wilhite, Bill Asher, Luther Thomas, and Pieter E. Hoekstra. Nitrogen Division—Cliff Camp and Cooper Morcock.

SOUTHWEST YOUNG TREE SEEDS

Here are excerpts from a talk by Dr. L. C. Walker, Chief Forester, NPFI, at the Texas Forestry Association annual meeting:

"Information presently being

mum fertilizer response and the annual and cumulative nutrient uptake by even-aged stands of loblolly pine.

Texas Forest Service, College Station, Texas, Dr. Claud Brown, stimulation of high quality seed production of young loblolly pine.

University of Georgia, Athens, Georgia, Prof. John Hamilton, changes in wood characteristics, important in pulp and lumber manufacture, resulting from nutritional supplements.

North Carolina State College, Raleigh, North Carolina, Dr. T. E. Maki, fertilization effects on the vigor and growth of pine plantations in wet, coastal sites.

Duke University, Botany Department, Durham, North Carolina, Dr. Paul J. Kramer, relationships between water and nitrogen supply in the growth of loblolly pine seedlings.

Dr. Tisdale said the grants were recommended by a southern regional forest fertilization task force comprised of seven men from the forest industry, the U. S. Forest Service, the southern forestry schools, and the fertilizer industry. Dr. L. C. Walker, Southeastern Regional Forester for the Institute, continues as Chairman of the Task Force.

sought in forest fertilization research throughout the South deals with stimulating growth of forest trees and the production of seed. Associated studies involve oak mast production for wildlife food, gum yield in naval stores operations, effects on wood quality, tree diseases, insect attacks, and Christmas tree colorations.

"Most of the work is with loblolly and slash pine plantations, but some research is underway with other pines and hardwoods in both natural and artificially-established stands.

"Research is needed to determine if inheritance is an important factor in efficient utilization of nutrients for tree growth, if controlling undesirable hardwoods releases sufficient soil moisture to make the addition of fertilizers effective in sites where fertilizers may not otherwise stimulate growth, and the recycling rate of plant nutrients in forest soils.

"The phenomenal gibrel reaction

brought to light by foresters at Stephen F. Austin College deserves further study in relating the effects of that synthetic hormone with fertilization.

"Work is underway in the Texas Forest Service at Texas A & M College to learn if fertilization can result in seed production on very young trees, and if quality of forest tree seed is improved.

"In our laboratory at the University of Georgia, experimenters are locating the feeder roots of southern pines in various soil types. Radioactive-tagged phosphorus is used for tracing their whereabouts. This is basic to ascertaining where to apply fertilizers for maximum uptake by trees.

"That the problems of forest fertilization will be solved, I am optimistic. Then, whether or not we use fertilizers in Southern forests will depend on the American economic system, for 'the worth of a thing is the price it will bring.'

GEORGIA PINE PROJECT:

1. Applying 6-12-12 in the pine gum experiment.
2. Applying additional nitrogen to the experimental plots.
3. Natural reseeding around the stump following thinning operation; viewed by Leroy Tippens, Nitrogen Division Allied Chemical and Ar-

thur G. Steedley, Area Forester, Naval Stores Program, U. S. Forest Service.

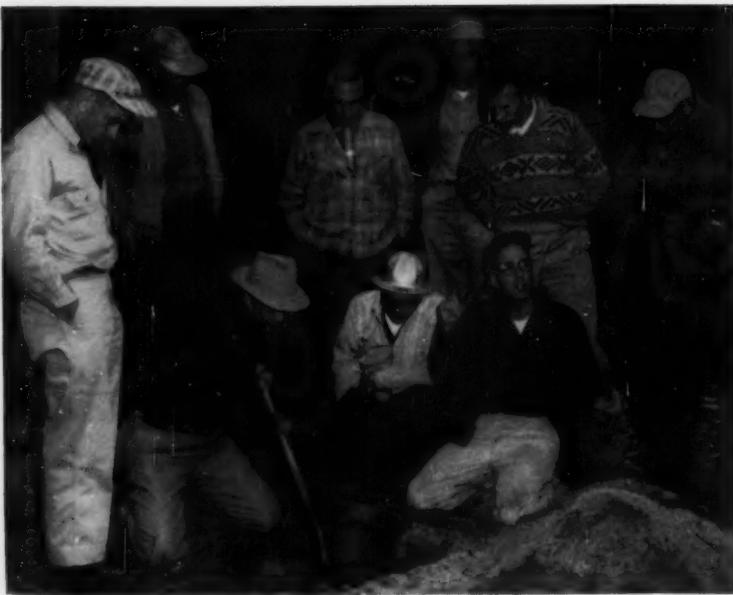
4. Making the last chip (cutting) at the end of the season.
5. Applying sulphuric acid to the new streak to stimulate flow of gum.
6. One season's gum flow from face of high producing fertilized tree.



NORTHWEST PINE MANAGEMENT

At the second annual Agro-Forestry meeting, sponsored jointly by the Oregon State College and NPF, and held at the Deschutes Research Center, Pringle Falls, some 45 fertilizer agronomists and foresters met to discuss proper management of ponderosa and lodgepole pine forests. Here are briefs of what they heard:

"Studies being carried on at Pringle Falls apply to approximately 15 million acres in the surrounding area," stated Carl Berntsen, U.S.D.A. forester in charge of the Deschutes Research Center. "Our objective in the studies is to obtain maximum wood production. We need to double our present production during the next 40 years if we are to keep up with the present use schedule. Stocked land is now producing a



Chet Youngberg, O.S.C. Forest Soils Specialist kneeling on right, discusses pumice soils in Ponderosa pine area at Agro-Forestry Meeting. Horace Cheney, Oregon State College soils department head wields the shovel while S. P. Gessel, University of Washington, (kneeling) looks on. From left to right, standing: Bernard Duberow, Deschutes Research Center; Tom Jackson, O.S.C. soils scientist; Dick Mathews, Atkins Kroll; Carl Berntsen, Deschutes Research Center; Dwight Didzun, Harrisons & Crosfield; Trevor Steele, American Potash and Chemical Corp.

mean annual increment of 150 board feet per acre. This must be increased to 300 board feet per acre," Mr. Berntsen added.

Bernard Duberow, research forester at Deschutes, discussed management practices, including thinning and pruning, of ponderosa pine. "Ponderosa pine grows in rainfall areas ranging from 10-60" annual precipitation and on a wide variety of soils," Mr. Duberow stated. He said that very few fertilizer studies were under way in the pine area at the present time. "We need to establish some fertilizer studies in the pine area on (1) thinned stands and (2) in seed production areas to see if we can duplicate yield responses that have been obtained in the Douglas fir region."

Chet Youngberg, Oregon State College forest soils specialist, discussed the soils characteristics of the pumice soils which cover a large part of the Pringle Falls area. "The pumice soils have an average pH of 6.4 and are quite low in phosphorus and exchangeable bases. The average organic matter content is about 0.56 percent. We have gotten an excellent response to nitrogen, phosphorus and sulfur on young pine seedlings grown under greenhouse conditions at Corvallis," Youngberg stated.

Tom Jackson, Oregon State Soil Scientist, emphasized the importance of multiple plant nutrient use

on the pumice soils. "In our studies with alfalfa on these soils, we have found that fertilizer interactions are of vital importance, i.e. nitrogen will not be utilized until sulfur is also added and phosphorus is necessary for the proper utilization of nitrogen and sulfur," Jackson stated.

Ed Mowat discussed the importance of thinning stands of ponderosa pine to get the proper amount of stocking per acre. "Studies are now under way to determine the optimum number of trees necessary for maximum production at the various stages of growth under known soil moisture conditions. Numbers of trees in the experiment will vary from 1000 to 62 trees per acre. On half of these plots vegetation has been removed to determine the effect of vegetation on suppressing optimum growth." In response to a question from the assembled group, Mr. Mowat stated that if future experiments with fertilizers indicated a need for plant food, the number of pine trees per acre might be increased considerably similar to the number of corn plants per acre had been increased with a good soil fertility program.

Walter Dahms, research forester with Deschutes, discussed lodgepole pine management. Lodgepole pine occupies one million acres, or about 18% of the commercial forest lands along the eastern slopes of the Cascades in Oregon. It is cut for lumber and has proven to be a good

pulpwood species. "Proper management of this species would produce enough wood to support 15 good sized pulp wood plants," Mr. Dahms said. Good management includes thinning, control of insects and diseases, control of mistletoe, and planting of lodgepole pine in the proper soil-climatic area.

Hardy Glascock, Jr., Western Forestry and Conservation representative stressed the need of research to control forest losses due to insects, diseases and animals. "Fire used to be our most important forest enemy, but only 5% of the annual losses in raw timber are now caused by fire, whereas 75% of our present losses are due to insects, diseases, and animal damage.

Many of the foresters present discussed the need of an animal repellent, preferably a systemic, to stop the wholesale destruction of new pine seedlings by deer, rabbits, groundhogs, etc. Field trips taken by the group added further emphasis to this need, as destruction to young pine seedlings was in evidence in all newly planted areas.

C. O. Borsting, Weyerhaeuser Timber Co. forester, discussed the use their company was making of aerial photos to get timber information and soils information on one map. "Detailed information of this type is used in fire zone information, road development work, and as a basis for establishing a proper cutting cycle.

Bill Currier, U. S. Forest Service,
(concluded on page 64)



The Conservation people are looking for a "two-legged symbol" which will represent their protection of "our soils and minerals, forests, waters and wildlife" as Smokey the Bear—the U.S. and State forestry services symbol represents protection of our forests from fire. Fertilizer people have a big interest in both kinds of conservation. Maybe you have an idea.

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ARIZONA

Arizona Fertilizers Inc., Phoenix, has organized **Cortez Chemical Co.**, a wholly owned subsidiary, and changed the name of the parent company to **Arizona Fertilizer & Chemical Co.**

FLORIDA

Armour Agricultural Chemical Co. has asked to be permitted to mine phosphate inside the Bartow city limits, where a lake could be created.

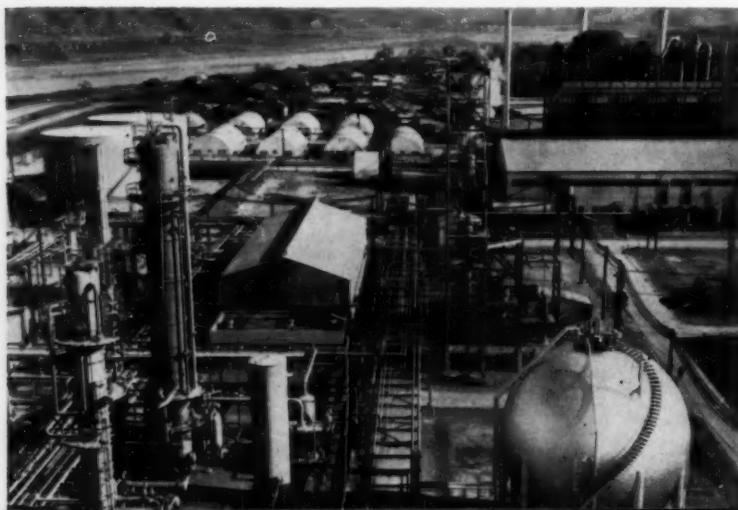
* * *

Griffin Fertilizer Co., Frostproof, a division of Ben Hill Griffin Co., which has recently acquired all the Frostproof assets of Minute Maid, recently held open house to display their new plant. The old Minute Maid fertilizer plant has been abandoned by the Griffin firm, and all-new equipment has been installed at a new site, a former citrus packing house. Capacity of the new facility is 30,000 annual tons, and delivery can be made in bulk or bags. The plant operations are headed by Excell R. Johnston, who has been Minute Maid's fertilizer division manager. R. L. "Smokey" Padgett, for 10 years head of the Griffin grove caretaking operation will be in sales. Ray Joiner who has operated a fertilizer plant in Winter Haven the past 5 years and M. J. Thompson, bookkeeper who has been in the fertilizer field in that area for many years, will also be among the 12 persons employed.

* * *

Citrus Culture Corp., Mount Dora, is back in operation with a new \$275,000 fertilizer plant almost exactly a year after fire destroyed their former plant. The new building is more fire-resistant than the old one, and is equipped with a complete sprinkler system. Capacity has been boosted by 50%, as the new

A section of Korea's first fertilizer plant at Choongloo, South Korea. The plant was built at a cost of \$40,000,000, financed mainly by U. S. International Cooperation Administration (ICA), and was scheduled to begin operations near the end of last month. This plant will produce 250 daily metric tons of urea fertilizer. McGraw-Hydrocarbon was the contractor.



facility has a 1½-ton mixer rated at 45-ton-per-hour output. It operates five bulk fertilizer carriers and 12 bagged fertilizer trucks. Grove caretaking is a function of the organization and employs 30 people in addition to the 50 who are in the fertilizer plant at seasonal peaks. J. E. Fortner is president.

IDAHO

Idaho Phosphate Works, Georgetown, owned by the Central Farmers Fertilizer Company, Chicago, was dedicated recently, with some 200 in attendance. As our readers know, this is the first commercial phosphate concentrating plant outside of TVA to produce superphosphoric acid and a new high-analysis concentrated 53-55 P superphosphate.

Central Farmers is owned by 25 fertilizer cooperatives over an area of 25 states, and these were represented at the dedication, as were various dignitaries. The program began with a breakfast, included a plant tour, and ended with a dinner in Montpelier. Joseph J. Lanter, Central Farmers president was master of ceremonies.

Ground was broken for the plant in June 1957 and it was completed just two years later. Engineering by H. K. Ferguson Co.; construction by Jacobson Construction Co.

ILLINOIS

Kickapoo Valley Chemical Com-

pany expects by December to have completed its new plant in the Atlanta area, which represents an investment of \$65,000. The company is operated by Frank and Joe Hoblit, who have been in the fertilizer business for seven years, the original plant being located on the Hoblit Farms.

IOWA

The Farmers Elevator Co., Rock Valley, will build a new fertilizer blending plant with a capacity of up to 1,000 tons.

KENTUCKY

Glasgow Fertilizer Company, Glasgow, is to be set up to manufacture fertilizer.

NORTH CAROLINA

Wilmington Fertilizer Co., Wilmington, expects to be back in production by next month with a plant producing some 35,000 annual tons to replace the one destroyed by fire last May. The new building cost \$100,000. (See Personals for officers elected).

OHIO

G.B.C. Chemical Co. has chosen a site in New Bremen, and has begun construction of a new fertilizer plant 112 feet by 140, with a 24 foot by 42 office and storage building. Frank L. Miller, presently in charge, is father of M. K. Miller, president of the parent company, Green Belt Chemical Co., St. Paris, Ohio. Other subsidiary plants are operated at Bryant and Fairmount, Ind.

SOUTH CAROLINA

Virginia-Carolina and Davison Chemical plants at Charleston were both hit by Hurricane Gracie, but shut down only briefly as a result. Davison's problem was complicated by the big Esso gasoline fire nearby, and kept its sulfuric plant shut down for several days.

TEXAS

Edna Liquid Fertilizer Co., Edna, is reported in line for a Small Business Administration loan of \$14,000.

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BRAZIL

Granubras, S.A., San Paulo, has inaugurated its Cr\$40,000,000 granulated fertilizer plant, which has a capacity of 15,000 monthly tons.

CANADA

Rainbow Chemicals Ltd. Tilbury, has announced a major expansion program involving new office space, additional tank storage, and improved plant process facilities, according to R. T. Henry, manager of the bulk liquid fertilizer mixing firm.

A new 32' x 72' building of block and brick construction will contain offices, locker room and related facilities. Three new 55,000-gallon steel tanks are being erected for additional storage of finished fertilizer products.

Increased plant capacity is being accomplished by redesigning and enlarging processing facilities installed when the plant was constructed in 1956. Removal of the office from the plant building will give additional storage space for raw materials. New pumping equipment will give faster loading at the delivery scales, and a new heavy-duty delivery and spreader truck has been added to their fleet.

A. B. Reed is president of the firm and F. G. Ledlow is sales manager.

The Consolidated Mining and Smelting Company of Canada, Ltd., with headquarters at Trail, B. C., has announced completion of plans for a 100 daily tons urea plant to be installed at its Calgary, Alberta site. Vulcan-Cincinnati, Inc., Cincinnati, Ohio, will supply all engineering and equipment for the new plant, Cominco sources revealed.

The new plant will supply prilled urea to Western Canada and the Western and Northwestern United States. Vulcan-Cincinnati, Inc. will employ the exclusive Inventa-Vulcan urea process in the new plant, and will supply facilities for total recycle of ammonia off-gas. Vulcan also will provide a hot-carbonate system for the purification of ammonia synthesis gas by removal of carbon dioxide.

The plant, to be completed in 10 months, will be designed to operate in outside temperatures as low as -50°F, and will be integrated with other nitrogen products operations at the Calgary site, where Cominco is a major producer of ammonia and ammonium nitrate.

Other plants utilizing the Inventa-

Vulcan process have been supplied by Vulcan-Cincinnati, Inc., for The Standard Oil Company (Ohio); Southern Nitrogen Company; Hercules Powder Company; and Mississippi Chemical Corporation, all in the United States. Overseas plants were engineered by Vulcan for Taiwan Fertilizer Company, Ltd., on Formosa, and for the Republic of Korea.

* * *

Canadian Industries Ltd. will build a \$500,000 liquid caustic potash plant at Cornwall, Ont. with capacity said to be enough to meet all foreseeable Canadian requirements, according to J. D. Converse, general manager of the CIL chemical division. The unit will be ready by the middle of next year.

* * *

United Cooperatives of Ontario have announced a \$500,000 fertilizer plant at Tillsonburg, operations due to start in mid-1960.

* * *

Multi-Minerals after several months of drilling, have outlined the "largest potential source of phosphate (apatite) in Canada," according to E. F. Carr, president. The location is 160 miles north of Sudbury, and they include in their outline some 30,000,000 tons. Another 10,000,000 proved up, Mr. Carr says, will make this an attractive commercial proposition. Drilling continues to measure the depth of the outlined area.

COSTA RICA

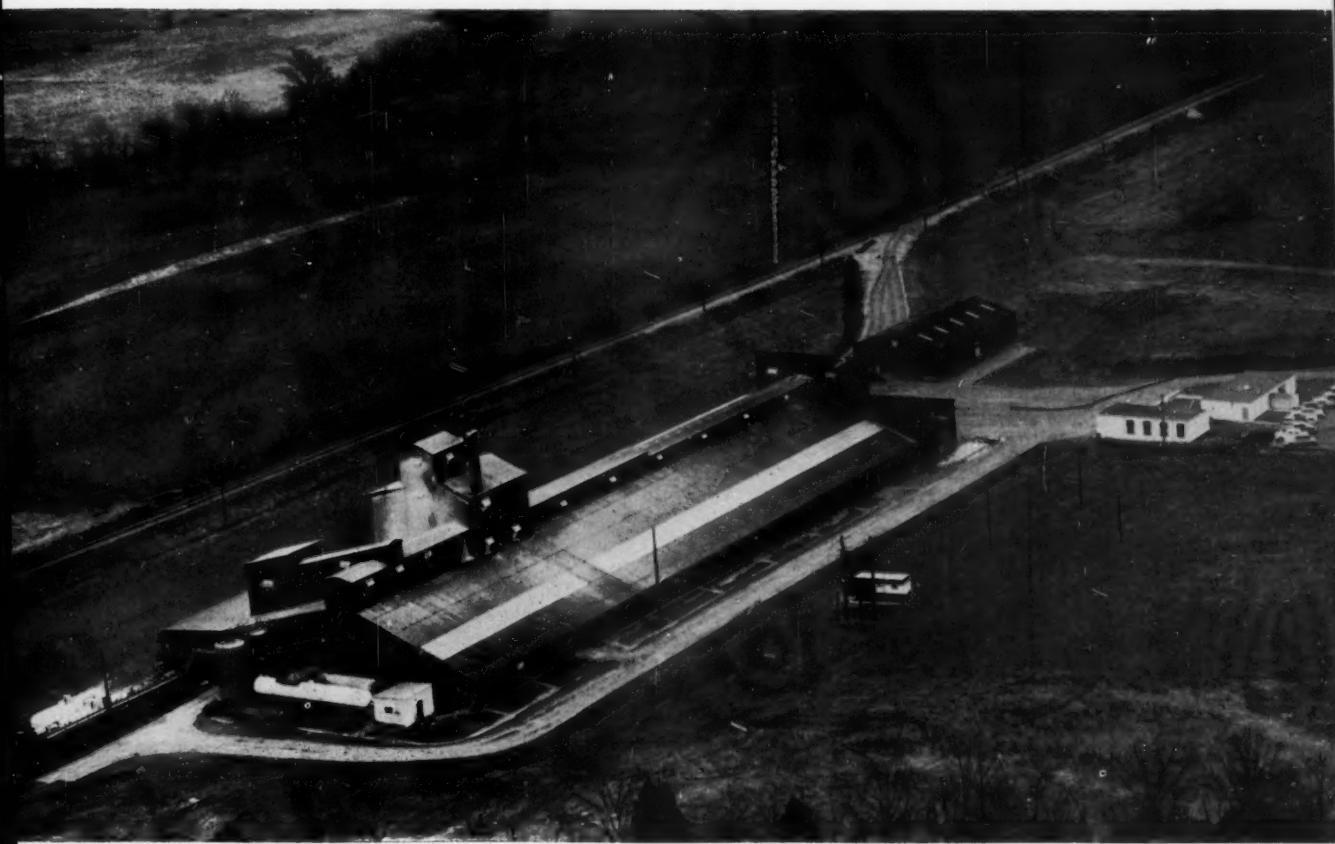
Fertilizantes Centro Americana, S.A. is planning a \$20,000,000 fertilizer plant to produce 200,000 annual tons, which would be constructed by Industrial Chemical Co. Most of the equipment would be supplied by Thyssen-Hueth, Germany.

INDIA

Andhra Pradesh has been given the green light on its proposal to build a fertilizer plant estimated at Rs 30 crores. The plant is scheduled to have a production of 3-lakh tons. The Government will hold at least 51%. The plant is slated for 1963 production.

PERU

Fertilizantes Sinteticos, S.A. has a commitment for \$1,400,000 from I.F.C. to build the Monsanto-sponsored plant at Callao. It is to have capacity of 17,000 annual tons, and to cost \$12,800,000.



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CF Staff-Tabulated TONNAGE REPORTS

FERTILIZER TONNAGE REPORT (in equivalent short tons) Compiled by Cooperating State Control Officials
and Tabulated by COMMERCIAL FERTILIZER Staff

STATE	September		August		April-June		Quarter		January-June		July-December		YEAR	(July-June)
	1959	1958	1959	1958	1959	1958	1959	1958	1959	1958	1958	1957	1958-59	1957-58
Alabama	53,879*	24,068	22,611	549,564	487,441	846,309	734,077	199,265	172,721	1,045,574	906,798			
Arkansas	15,111	13,570	9,071	7,919	175,592	150,970	289,365	226,889	64,092	62,752	353,132	289,641		
Georgia	22,833	15,206	32,120	23,557	955,705	798,310	1,130,998	944,618	294,751	269,529	1,425,749	1,214,147		
Kentucky	22,624*	—	10,302*	—	307,715	290,423	483,821	435,023	99,460	88,771	583,281	523,794		
Louisiana	12,878	13,650	8,426	6,069	122,382	120,744	201,642	188,409	64,152	64,192	265,794	252,601		
Missouri	105,951*	55,435	41,952	390,700	333,851	563,055	420,615	370,036	335,312	926,111	755,927			
N. Carolina	49,929*	12,155	17,319	842,771	823,676	1,468,704	1,261,685	228,055	199,446	1,641,674	1,461,131			
Oklahoma	29,273*	9,853	8,448	38,937	35,804	64,738	55,964	68,848	51,436	133,586	107,400			
S. Carolina	22,994	29,006	11,817	11,030	370,628	328,955	756,100	615,733	134,202	116,874	890,302	732,607		
Tennessee	36,721	42,042	26,551	22,901	292,705	223,068	443,602	307,182	127,116	135,717	570,718	442,899		
Texas	52,426	45,298	27,081	26,311	228,767	288,802	441,851	452,327	222,800	213,801	664,651	666,128		
California	(reports compiled quarterly)		485,672	426,032	803,261	679,577	450,767	441,969	1,254,028	1,121,546				
Virginia	(reports compiled quarterly)		303,300	331,222	618,965	549,773	160,178	140,783	779,143	690,556				
Indiana	(reports compiled semi-annually)				856,316	795,506	316,341	284,959	1,172,657	1,080,465				
New Hampshire	(reports compiled semi-annually)				16,143	16,053	4,746	3,966	20,889	20,019				
Washington	(reports compiled semi-annually)				—	158,286*	75,350	77,498	—	235,784*				
TOTAL	162,963	158,782	216,577	188,117	5,064,438	4,639,298	8,984,870	7,683,431	2,880,159	2,659,726	11,727,289	10,265,659		

(not yet reported)

* Omitted from column total to allow comparison with same period of current year.

TONNAGE and REGULATION NOTES

Louisiana Gains 10%

Louisiana wound up its fiscal fertilizer year with a gain of nearly ten percent over the 1957-58 period. Tonnage reported for the September 1, 1958 to August 31, 1959 year was 271,909 tons, a gain of 24,160 tons over the 247,749 tons reported during the preceding fiscal year.

Arkansas Shows 22% Increase

Revised figures for the fertilizer year ending June 30, 1959 show Arkansas with 353,132 tons, 22% above the figure for the preceding year. The 1958-59 year registered an increase of 63,491 tons over the 289,641 tons reported for the 1957-58 year.

164,028 tons of the 353,132 tons sold during 1958-59 was in the form of mixed goods, and the remaining 189,104 tons was sold as straight materials. The 5-10-5 grade led the parade, tallying sales of 28,314 tons, and was closely followed by 10-20-10 with 24,487 tons sold; the 5-10-5 grade showed a decrease of more than two thousand tons from the preceding year, while 10-20-10 showed a gain of nearly 1500 tons.

Fertilizer materials used for direct application showed a more substan-

tial increase than did mixed goods; during 1958-59 materials accounted for 53.6% of total deliveries, as compared with 51.7% a year earlier.

Recommended Grades Gain in Georgia

A special report just issued by R. A. Moncrief, chief of the fertilizer section of the Georgia Department of Agriculture shows that 4-12-12, a grade strongly recommended by the extension service, accounted for 44.65% of all tonnage in the state during the first six months of 1959. The grade tallied 487,913 tons out of a total of 1,092,608 tons of mixtures and materials sold during the half-year. Next in popularity was 5-10-15, with deliveries of 152,371 tons accounting for 13.94% of all sales. No other grade or straight material accounted for as much as 7% of the tonnage.

Four Million Tons of Ammonia

The impetus given to ammonia production by heavy spring demands for fertilizer promises to push 1959 output above the 4 million-ton mark, and very likely above 1958 output by 10 percent or more, according to U. S. Department of Commerce sources.

This production would be attained at an operating rate of approximately 85 percent of capacity if the Morgantown, West Virginia, Government plant, which has been shut down since mid-1958, is excluded.

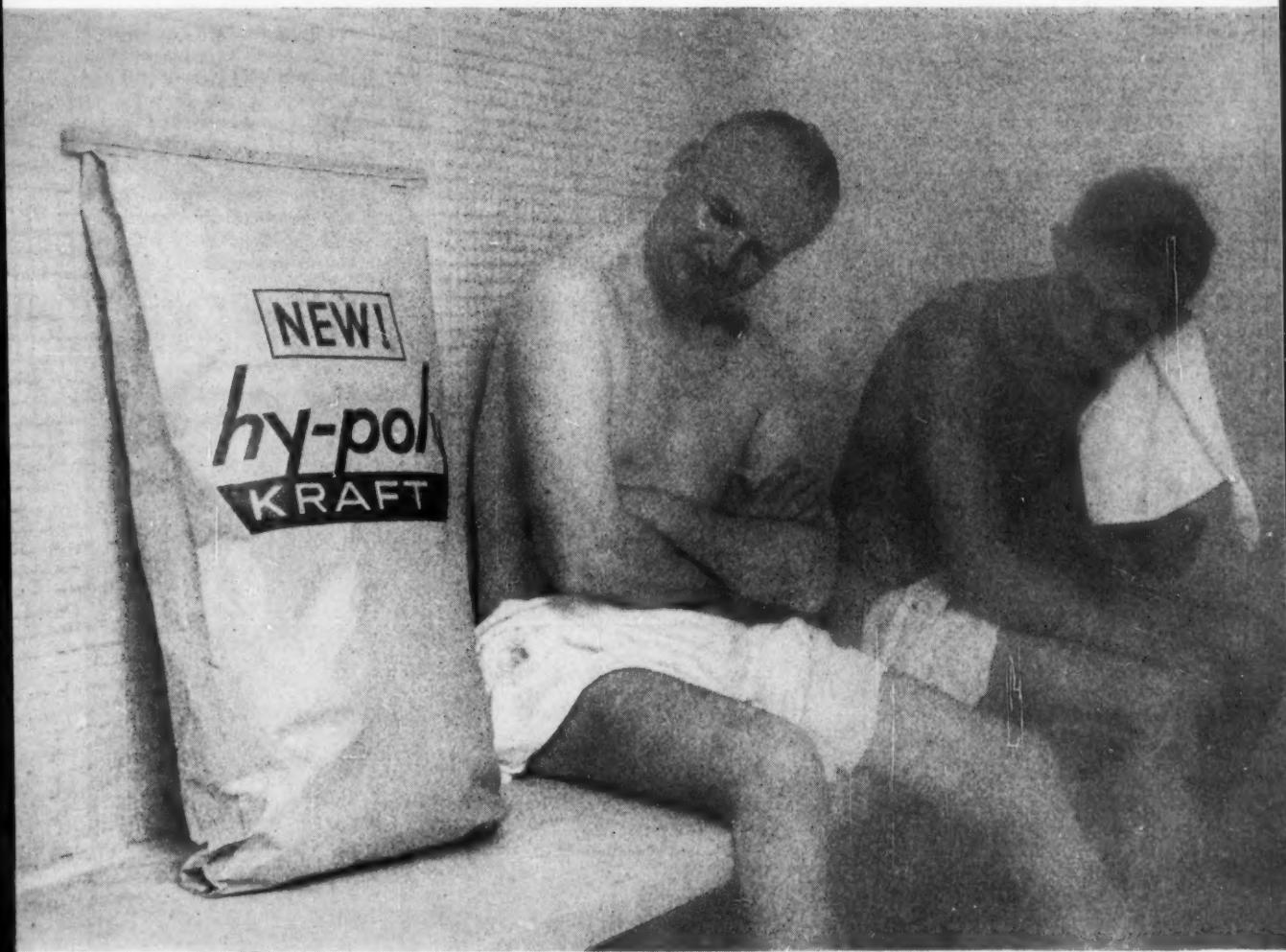
New plants or expansion of existing facilities begun or scheduled to come on stream in 1959 may add about 200,000 tons to capacity by 1960.

FAO Publishes Fertilizer Book

The Food and Agriculture Organization of the United Nations has issued a pamphlet describing their new book, "Efficient Use of Fertilizer." Edited by Vladimir Ignatjeff, their agricultural officer, and Harold J. Page, consultant on soil fertility and fertilizers, it is a practical, 356 page manual for the agricultural planner. There are 43 illustrations.

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See how calcium chloride protected by Hy-poly kraft Bagpak, pours after 48-hour steam bath!

Bagpak Division **INTERNATIONAL PAPER** New York 17, N.Y.

SOUTHEAST:

4th ANNUAL CONFERENCE

The attendance of 300 at this NPFI-sponsored annual event showed how eagerly the fertilizer people of the region, both manufacturers and suppliers, respond to an opportunity to learn where and how more fertilizer volume is to be had, and how they can aid the farmer to a recognition of the facts of farm life.

Meeting September 30 and October 1 in Atlanta, the actual meeting was a one morning session, with a hospitality hour the preceding evening.

The session on October 1 was presided over by T. F. Bridgers, Farmers Cotton Oil, of the program committee. His fellow committee members were L. D. Hand, Pelham Phosphate Co.; S. L. Tisdale, NPFI; Howard Parker, Parker Fertilizer Co., chairman.

The various speakers did a thorough job of covering the conditions we face in the Southeast, with the small farm facing extinction as more and more real efficiency is demanded of agriculture, and the means we as an industry can take to aid the small man, and serve the big one.

The first speaker was Dr. E. T. York, director of the Alabama AES. Here are some highlights of that talk:

"The type of extension program that has recently developed in the Southeast and which in certain areas has met with marked success are the county soil fertility programs. The approach used in these programs is that soil fertility and soil acidity are currently the two most important barriers to more efficient agricultural production. Using better soil fertility as the theme for the program, farmers are then encouraged to take soil samples and to follow the lime and fertilizer recommendations made on the basis of these tests.

"The program seems to have caught on extremely well. Many groups other than farmers have participated through publicity, advertising, distribution of soil sample materials, and in other ways. These fertility programs have proved to be an excellent extension tool and in many cases have been responsible for the county agent having reached farmers he heretofore had been unable to communicate with.

"They've brought positive results, too. In some counties, where these programs have been carried out, farm income has been increased by one year's time by several million dollars. Fertilizer consump-

tion was materially increased as has been the consumption of lime.

"Fertilizer recommendations made by most land-grant colleges in the Southeast call for amounts of nitrogen, phosphate, and potash

NPFI REGIONAL MEETINGS

The National Plant Food Institute has held two recent regional meetings, one September 24-25 in New York with 150 in attendance; another—which was the fourth such annual conference in the Southeast—was held in Atlanta, September 30 and October 1 with 300 in attendance.

1. Bryan Cooper, Cooper Fertilizer & Chemical Co., Mullins, S. C., and Burke Garrette, U. S. Potash Co., Atlanta.
2. H. T. Rogers, Auburn University, Auburn, Ala.; and H. B. Mann, American Potash Institute, Washington, D. C.
3. Howard Parker, Parker Fertilizer Co., Sylacauga, Ala., and Elam Nunnally, Cotton Producers Assn., Atlanta.
4. E. T. York, Alabama Extension Service, Auburn, and W. D. Bishop, Tennessee Extension Service, Knoxville.
5. Tom Bridgers, Farmers Cotton Oil Co., Wilson, N. C., and Walton Dennis, International Minerals & Chemical Corp., Raleigh.
6. C. E. Walls, Du Pont, Atlanta, and W. O. Trogdon, Texas Experiment Station, College Station.
7. Gaines Boynton, International Minerals & Chemical Corp., Atlanta, and Ray King, Georgia Fertilizer Co., Valdosta.
8. Jim Champion, Jr., Albany Warehouse Co.,

Albany, Ga., and Joe Bond, American Cyanamid Co., Toccoa, Ga.

9. Bob Fisackerly, Mississippi Chemical Corp., Yazoo City, and W. H. Appleton, Potash Company of America, Atlanta.



that are about double the amounts being sold by the fertilizer industry today.

"Farmers in the South are coming to look upon their operation as a business. They are beginning to think more in terms of efficient production and returns per dollar invested in the enterprise. They will consider more closely the factors involved in the production of a commodity and they will use the most efficient combinations of inputs to produce that commodity.

1. Bill Baughcum of East Point, Ga., John D. Zigler of Skokie, Ill., and Sam Marshall, of Tupelo, Miss., all with International Minerals & Chemical Corp.
2. H. V. Miller, Harry Varner, T. W. Oliver and Fred Lyon, all with Armour Agricultural Chemical Co., Atlanta.
3. Ralph Boynton, U. S. Potash Co., New York; Quentin Lee, Cotton Producers Assn., Atlanta; Bob Walton, U. S. Potash Co., Atlanta.
4. M. S. Williams, National Plant Food Institute, Washington; Sam Marshall, International Minerals & Chemical Corp., Tupelo, Miss.; and Raoul Alstetter, National Plant Food Institute, Washington.
5. W. H. Paden, Clemson College, Clemson, S. C.; D. H. Banks, Sr., Banks Fertilizer Co., St. Matthews, S. C.; and Ed Parker, Spencer Chemical Co., Atlanta.
6. Mercer Rowe, Ashcraft-Wilkinson Co., and Gordon Cunningham, and

As this trend toward more and more efficient production proceeds, farmers will more and more substitute capital for land and labor. More specifically, they will use more fertilizer and lime to produce higher yields on the same or perhaps on a slightly increased number of acres."

Having established these major points by Dr. York, Dr. M. S. Williams followed up with "Know your customer," a logical starting point for a panel titled "The Farm-

er Needs Your Product." Dr. Williams is NPFI's chief agricultural economist. Here are highlights of his talk:

"I firmly believe that better understanding of our customers can help us do a better job in providing them with the kinds and amounts of fertilizers that they need and should be using.

"Farmers, as businessmen, are looking for ways to increase production, cut costs, and increase profits. But our customers have many

- J. W. Burdette, both with Tennessee Corp., all from Atlanta.
7. E. K. Chandler, National Plant Food Institute, Knoxville, Tenn.; Frank Boyd, Virginia-Carolina Chemical Corp., Montgomery, Ala.; J. T. Lowery, Alabama Extension Service, Auburn; Louis Wilson, National Plant Food Institute, Washington; and Charlie Summerour, American Potash Institute, Montgomery.
8. Eugene German, Duval Sulphur and Potash Co., Houston; Ray Yates of Norfolk and Tom Nixon of Atlanta, both with Ashcraft-Wilkinson Co.
9. H. M. Arnold, H. M. Arnold Fertilizer Co., Monroe, Ga.; Joe Scroggs, Potash Company of America, Atlanta; H. M. Arnold, Jr., H. M. Arnold Fertilizer Co., Monroe; and Joe Asher, Allied Chemical Corp., Nitrogen Div., Macon, Ga.
10. Clare Graft, Alabama By-Products Co., Birmingham; W. H. Mitchell, Tennessee Farmers Coop., LaVergne; and Dallas Cantwell, Southern Nitrogen Co., Savannah.



competing for their dollars. Just as most of us, farmers have the problem of deciding how much of their income to spend for production and investment items such as fertilizer and how much to put on consumption items such as a new car, a new refrigerator, television, or other items for family living.

"Our customers buy fertilizer on the basis of thinking and on the basis of emotion. If we ignore that the human is an emotional as well as a rational being, then we will have difficulty in understanding our customers.

"Like the rest of us, farmers like to think they make up their own minds and they do. Yet, they generally turn to someone else for help in making decisions. They will accept and use information from other people if it is presented to them skillfully.

"Farmers rely heavily on personal contacts for information and help. For fertilizer information they turn to local fertilizer dealers, neighbors and friends, county agents, the Soil Conservation Service, and others such as vocational teachers and bankers. The most important individuals appear to be the fertilizer dealer, neighbors and county agents.

"Farmers rely for their fertilizer information on many sources. Those that appear to be most important in the Southeast are soil test, demonstrations, personal experience and trial by the individual, and what they read and hear. The agricultural colleges in the Southeast have gained a pre-

dominant position in the minds of the farmer.

"The trends in agriculture in the Southeast are going to make the continuing study of our customers a necessity if we are to be most effective. A few of these trends and their implications are as follows: There will be fewer farmers and hence fewer customers. There will be larger farms and hence more special problems. In the years ahead, we will have better educated customers and hence they will be asked more questions and better questions. Customers are demanding more service and will continue to demand more service. Hence, it will take more time per sale. There will continue to be intense competition in the fertilizer industry and with other uses of the farmer's funds. Hence, more effort will be required to complete the sale.

"The only way to really know your customer is to study your customer. I am firmly convinced that a continuing study of your customer will reward you in increased sales and a more efficient agriculture in the Southeast."

The second panel talk . . . "Because it will make him money" was presented by E. K. Chandler, NPFI area representative. This is the essence of his presentation:

"Until farmers discover the importance of efficient use of fertilizer, they will be in a continuous price-cost squeeze. There are many ingredients in a successful farming formula, but none that yields a higher return per dollar invested, than fertilizer when properly used.

"Inefficient farmers already are learning about the law of diminishing returns and the law of the survival of the most efficient. Those who wish to survive must utilize every tool available to reduce production costs, increase yields and provide a quality product.

"As Dr. J. Fielding Reed of the American Potash Institute put it: The story is really a simple one—as yields go up, unit costs of production go down, and profits per acre go up.

"In all situations, soil fertility is basic to efficient crop production, but it takes a complete program of crop production to reach efficient levels of production. The team approach is needed to insure efficient production on the farm, because many farm supplies are needed, fertilizer equipment, seed, insecticides, etc.

"Too many people are confusing agricultural surplus with agricultural efficiency. Even some so-called well-informed manufacturers apologetically refer to the productive power of plant food. There can be no compromise with efficiency, and there can be no efficiency without the use of every essential ingredient in a successful farming formula. Fortunately for the American farmer, and the American consumer everywhere, there is a fertilizer industry producing the plant food that will pave the way not only for a productive agriculture, but for a more prosperous farmer and a consumer with an even higher standard of living than we enjoy today."

The third panel presentation, by James R. Turner of U. S. Borax, and Joe D. Burns of the Tennessee AES can be expressed in the following suggested steps for establishing agronomic demonstrations:

1. Select Fields: a. Should be easy to see and get to. b. Should have good stand, good soil for the crop to be grown.

2. Treat Plots: a. Use soil tests to determine fertility level and fertilizer needed. b. Have a check plot—no fertilizer. c. Keep it simple—2-3 plots. d. Make plots large enough to see and measure.

3. Label Plots: a. Show treatment on plot sign. b. Make letters and numbers large.

4. Publicize Demonstrations: a. Hold field meetings—let the farmer tell the story. b. Take pictures and slides to be used throughout the year. c. Use feature stories in newspapers and magazines.

5. Determine Differences: a.

Enlist Community Leaders For Northeast Soil Testing

The National Plant Food Institute is putting a great deal of effort into projects designed to increase farm income in two Northeast counties.

Merle Adams, Northeast representative of NPFI, described the plan at the Sept. 17 fertilizer conference for industry men at Rutgers University.

Pilot projects under way in Columbia County, Pa., and Chautauqua County, N. Y., are keyed to a push to get every farmer to have his soil tested. The efforts, said Mr. Adams, are designed to enlist bankers, businessmen, chambers of commerce and others who stand to benefit from the increased prosperity that can be expected to follow more widespread soil testing and probable

increased use of lime and fertilizers.

Soil testing is being emphasized, Mr. Adams explained, because in many cases farmers' fertilizer practices are influenced more by soil test reports than by any other factor. Usually other approved practices follow the farmer's acceptance of soil testing.

Dr. Ordway Starnes, associate director of the Rutgers Experiment Station, proposed an organization of fertilizer manufacturers and dealers on a state or regional basis. Such an organization, he said, could perform a valuable service by advising Station scientists on the research needs of the industry.

Several members of the Station staff reported work in progress.

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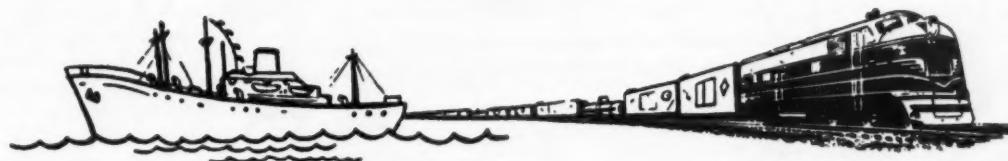
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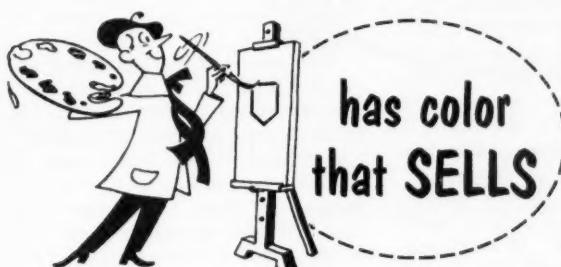
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The final speaker on the panel was Dr. R. L. Beacher, NPFI Southwestern Regional Director. Here are extracts from his paper:

"In a talk at this conference last year, I made the statement that "soil testing, soundly administered and adequately promoted, is one of the most useful sales tools available to the fertilizer industry. Few industries enjoy the distinct advantage of having so many unbiased, official laboratories recommending their project through agencies which hold such high prestige with the majority of farmers." Many of you undoubtedly agree with this conviction.

Soil testing is a useful sales tool because it can serve as an effective pry against two major barriers to fertilizer usage; i.e., (1) farmer's confusion or inability to clearly recognize his own soil needs, and (2) farmer's lack of confidence in profit from the fertilizer investment. Other "barriers" such as lack of money, fear of weather risks and harmful effects are of relatively little significance if farmers are convinced of the need and reasonably assured of a not-too-distant profit.

"Farmer confidence in profit from fertilizer use can be generated with informational materials and other effective mass media techniques. But the real clincher to confidence is the farmer's actual experience on his own or a nearby field—a supervised demonstration or a simple field trial on his own.

"Though demonstrations and field trials clinch farmer confidence, they cannot be set up on all farms; soil test recommendations are the only practical means of rapidly providing masses of farmers with a sound evaluation of their fertility needs on each individual field."

"Fertilizer Sales and the Fertilizer Dealer" was the subject of a presentation by Dr. J. M. Bohlen and Dr. George Beale, both of Iowa State's department of agricultural economics and rural sociology. As the basis for the presentation has been published as "Special Report No. 18, and can be had from the college at Ames, Iowa, we will only briefly discuss it.

The subject really boils down to the means of getting across to the farmer the facts which have been developed by agronomy and industry—and in essence it is the

bell-wether technique, so well known in many fields, and actually long in use in our own industry.

There are in agriculture "innovators". They are the people who first adopt new ideas, and they are the bell wethers, followed by their communities. And it is up to the industry and its dealers to make progress through these innovators.

Sell them and you sell the community seems to be the keystone fact.

The meeting concluded with a summation by Dr. Tisdale.

That afternoon and the next two days there were scheduled meetings: SE Regional Advisory Committee, Southern Soil Research Committee and Southern Extension Agronomists.

NORTHEAST ABOUT FORAGE AND LIVESTOCK

NPFI's Northeastern Regional Director, W. H. Garman, presided over this meeting which was occupied on the first day by reports from NPFI people. Dr. Garman, Russell Coleman and Merle Adams discussed the broader aspects of Forage Crops and Livestock Production in the area. Of special interest that day was Dr. Coleman's report on NPFI research and educational programs relating to the interlocking activities in this field.

On Friday, T. R. Cox, chairman, Northeastern Research and Education Committee, presided. Following a presentation of the NPFI motion picture "Cash in on Grass," prepared in cooperation with the American Grassland Council, "Converting Milk into Dollars" was the subject.

This was handled by Murry Junkin, U.S. Steel, and Francis A. Raymaley, American Cyanamid. They talked of the importance of quality forage to produce quality livestock, and ran the gamut from soil-testing to the use of lime and fertilizer in accordance with the soil-test findings. It was obvious from their figures that the market for fertilizer in this area is well below the potential, if dairymen build their grasslands and their herds to meet the demand which exists and is growing.

H. B. Sprague, head of the agronomy department of Penn State approached the livestock subject from the broader viewpoint of the nation as it will be when the predicted population levels are reached in 1957. Said he in part:

"First of all, let me say that I believe our future in the Northeast is tied in closely with the future of Agriculture in the United States as a whole. It would be most helpful if we could once and for all recognize that Agriculture is an essen-

tial and necessary part of our National economy. Agriculture is not a declining industry, in spite of the fact that we have in a few commodities, agricultural surpluses that seem to hang over the entire economic picture like a dark cloud. The real place of Agriculture in our Nation is **not** determined by the number of acres, or the number of farms, or the number of farmers; instead, the importance of Agriculture must be related to the number of people that are to be served. As everyone knows our population is increasing. When I was in college, the population of the United States was 120,000,000 people. It is now approximately 178,000,000. Our population experts predict that by 1975, just 15 years from now, we will have a population of 230,000,000. It is obvious, therefore, that agriculture is a growing industry, and that it must increase in its service to the people.

"The extent of the increase in agricultural service to our population may be stated in terms of the increased amount of food requirement. The United States Department of Agriculture has estimated that the **increase** of food requirements for our increased population will amount to 16.3 billion pounds of red meats, an **increase** of 1.1 billion pounds of chicken, and an **increase** of 22.0 billion quarts of milk. There are other increases also needed and I name these three because they are directly related to the livestock in the Northeast.

"We need to ask ourselves whether the Northeast will participate in producing the meat and milk needed by our increasing population, particularly for this region. This Northeastern region is perhaps the most densely populated of any section of the United States. Within this region, we have some 60 to 70

(Continued on page 64)

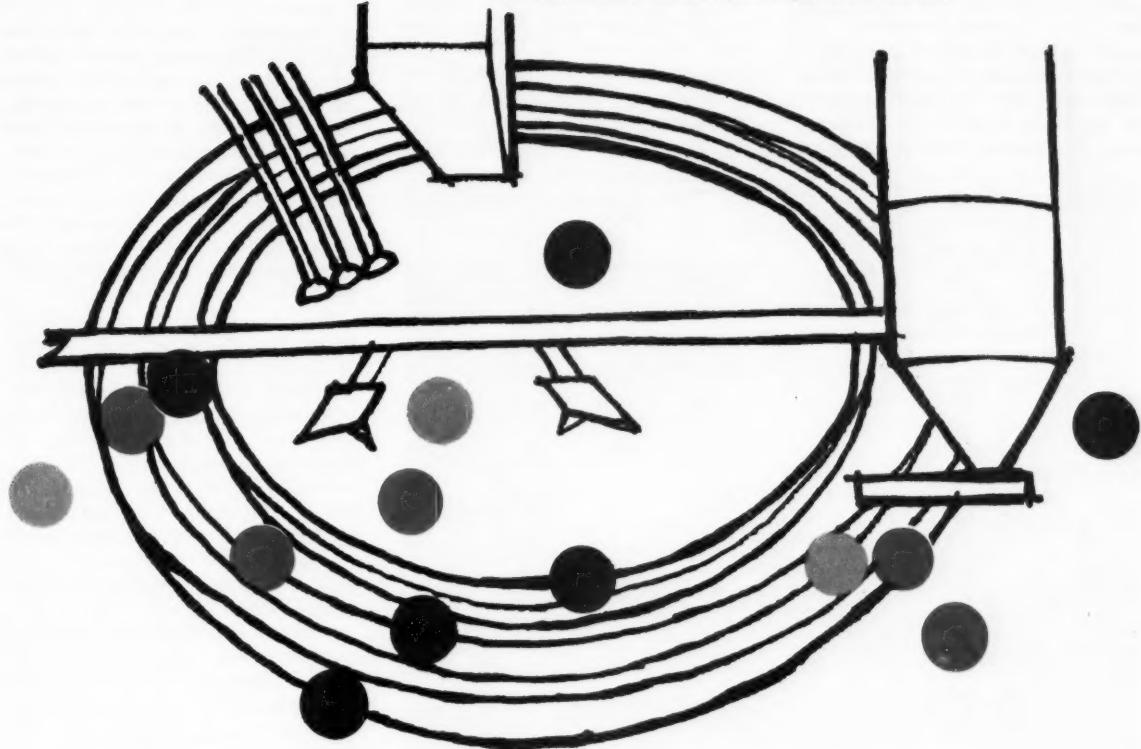
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THE "BRAIN CENTER"

FLO-MIX FERTILIZERS DEVISE INSTANT CONTROL FOR LIQUID FERTILIZER APPLICATION

A device for instant fingertip control of liquid fertilization of the soil under pressure has been developed by Flo-Mix Fertilizers Corporation of Houma, Louisiana.

The gadget is called the "Brain Center" because it converts anhydrous ammonia into aqua ammonia or combines it with a potash solution. Phosphatic fertilizer solution

is applied simultaneously but separately.

The "Brain Center" is of stainless steel construction and consists of mixing chambers, valves, pressure gauge and tubes. The tubes connect by a series of hoses to the ammonia and water tanks (potash solution may be substituted for water), and to nozzles which spray

the liquid fertilizer into the furrows made by small, sharp cutting blades.

The gadget simplifies the application and/or mixing of liquid materials and assures complete utilization of all ammonia or ammonia-potash solution.

Easily installed on any type or size farm tractor, it gives the driver instant control over the ratio of mixture and rate of flow of aqua ammonia or ammonia-potash solution.

Aside from its primary purpose of converting anhydrous ammonia into a liquid, the principal feature of the "Brain Center" is that it can be made a part of the equipment for application of anhydrous ammonia at an installation cost claimed to be nominal by the designer.

The ammonia tank can be mounted anywhere on the tractor and the water (or potash solution) tank pulled on a farm field cart or trailer.

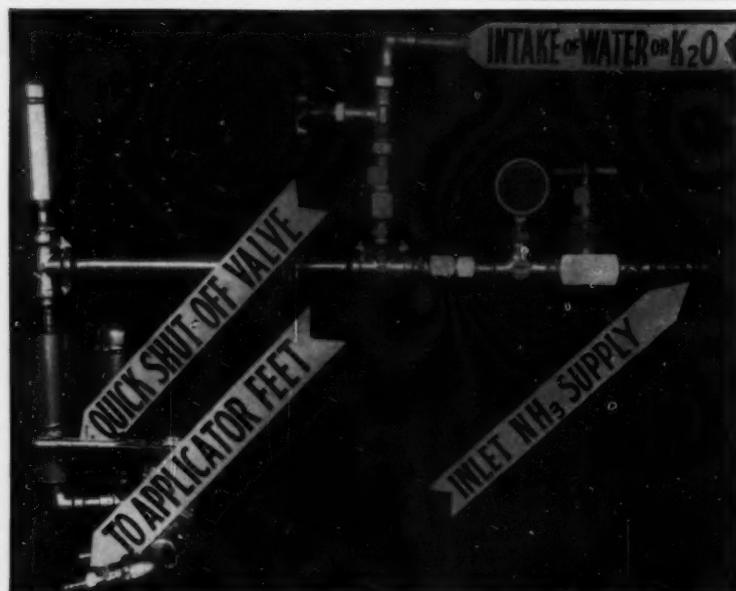
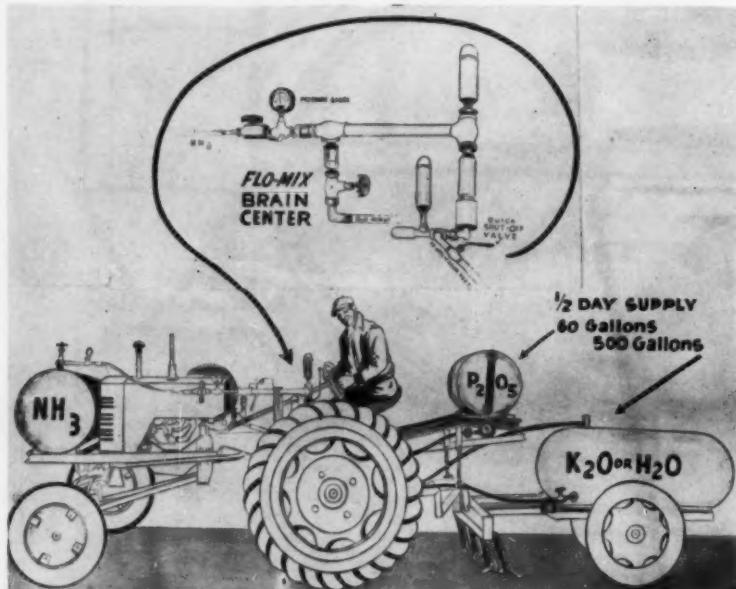
The "Brain Center" was developed by Flo-Mix after several years of research, experimentation and expenditure of several hundred thousand dollars in an effort to eliminate high losses in the application of anhydrous ammonia.

Tests conducted by Flo-Mix as well as by other companies and agencies showed that in some areas the loss in anhydrous ammonia ran as high as 25 per cent or more under certain conditions.

The "Brain Center" in converting anhydrous ammonia into a liquid is claimed to eliminate loss of ammonia and to assure 100-percent application, reducing the cost of fertilization and giving increased yield in crops and pastures.

Important during the test period were experiments conducted on pasturelands in which Flo-Mix's patented method of liquid fertilization was employed. The liquid was sprayed into the soil without disturbing the growth of grass or pasture crop and Flo-Mix states they observed not only excellent growth but green color even in dry seasons when many pastures were brown with burnt grass.

The Flo-Mix method, developed about 10 years ago, calls for the separate application of ammonia, potash and phosphoric acid in liquid form in a single operation. This is accomplished by adding a phosphoric acid tank on the tractor and connecting it to nozzles behind the cutting blades so that all three nutrients go into the soil at the same time.



Cyanamid



Kennedy



Phillips

Promotion of two key executives of American Cyanamid Company's agricultural division was announced by B. F. Bowman, divisional marketing director.

C. R. Kennedy, formerly northeast regional manager of the division, has been promoted to assistant manager of the phosphates and nitrogen department. Named to replace Mr. Kennedy was H. H. Phillips, who was assistant western regional manager with headquarters in Los Angeles. He has been with the company since 1946.

A realignment of key research scientists in the agricultural division was announced by Frank S. Washburn, divisional general manager.

Dr. J. T. Thurston has been named manager of research and development; Dr. E. L. R. Stokstad, director of research in biological sciences; and Dr. T. H. Jukes, director of chemical research.

The technical department, under the supervision of Dr. Thurston, has been re-named the development department and will continue under his direction.

Monsanto

Several changes in the agricultural chemicals sales organization of Monsanto Chemical Company's inorganic chemicals division were announced by James E. Crawford, division director of marketing.

Stewart D. Daniels of St. Louis, technical service manager for feed and fertilizers, becomes product manager, nitrogen chemicals.

John S. Moore, Jr., who has been a salesman stationed at Denver, becomes product supervisor of ammonium nitrate and urea with headquarters at St. Louis. Reporting to him will be Beal D. Hargrove, supervisor for agricultural nitrogen products and N. L. Reding, supervisor for industrial nitrogen products.

Ben W. Martin, a salesman stationed at Los Angeles, becomes product supervisor of anhydrous ammonia, nitrogen solutions and nitric acid with headquarters at St. Louis. Reporting to him will be A.

PEOPLE in the Industry

B. Bradley, supervisor for direct application materials.

John C. Docter of St. Louis, associate manager for direct applications, becomes customer service manager for agricultural chemicals. Reporting to him will be R. W. Goldthwaite and T. C. Welch, supervisors.

W. R. Bone of St. Louis, manager of nitrogen products, becomes technical service manager for agricultural chemicals.

All changes are effective immediately, Mr. Crawford said.

U. S. Borax



Taylor



Randolph

Appointment of Dr. D. S. Taylor as president and Dr. C. L. Randolph as vice president of U. S. Borax Research Corporation is announced by Hugo Riemer, executive vice president of United States Borax & Chemical Corporation and chairman of the board of its research subsidiary.

Dr. Randolph will be in active charge of operations at the research corporation's million-dollar laboratory facilities at Anaheim, California. He holds a Ph.D. degree from the University of Southern California and was associated with Aerojet-General Corporation before joining the research corporation in 1957.

Dr. Taylor, who recently was appointed vice president of the parent company, has been with US Borax and its predecessor companies for 14 years in various research and development capacities.

Mr. Riemer formerly was associated with the Nitrogen Division of Allied Chemical Corporation and served as president of the division during its period of expansion and until he joined U.S. Borax in 1958.

Appointment of Virgil O. McCollum as corporate director and E. D. Lemon as assistant director of industrial relations for United States Borax & Chemical Corporation is

announced by James M. Gerstley, president.

Mr. McCollum has served as industrial relations director for the U. S. Potash Company division at Carlsbad, New Mexico, since 1955. He has been with the company since 1932.

Mr. Lemon joined Pacific Coast Borax Company, predecessor of U. S. Borax, at Boron, Calif., in 1938. His most recent post was that of assistant to the general superintendent of the Boron facility.

Both will be stationed at corporate headquarters in Los Angeles.

St. Regis

St. Regis Paper Company announces the opening of the Ohio Valley regional headquarters of its flexible packaging products sales division at 17 North Fourth St., Columbus, Ohio.

Harry W. Walker, as regional sales manager, will head the office. He had previously been located at the company's Chicago office.

Peter Shaffer has been appointed sales service manager and is located at the Columbus office. Mr. Shaffer was formerly assistant to the regional sales manager of West Virginia Pulp and Paper Company.

G. C. Brown, packaging engineer, and Richard Cluth, sales representative, are also located at the Columbus office.

U. S. I.



Kilmer



Henley

Walter J. Kilmer has been made manager of the Detroit sales division for U. S. Industrial Chemicals Co., division of National Distillers and Chemical Corporation. Alden R. Ludlow, Jr., vice president in charge of sales, announced the new appointment. Mr. Kilmer succeeds Fred M. Henley, who is retiring.

Mr. Kilmer has been associated with U.S.I. for approximately twenty-five years. Mr. Henley joined U.S.I. in 1923.

Chase Bag



Quimby



Ogden

The Chase Bag Company has announced that A. C. "Chad" Ogden, sales manager of its Kansas City branch since 1956, has been appointed special representative in the Kansas City area. He has been succeeded as sales manager by H. R. Quimby, a sales representative for Chase in the same territory since 1946. Mr. Ogden joined Chase in 1940.

C. I. L.

The appointment of L. V. Clegg as general purchasing agent of the company has been announced by Canadian Industries Limited. He succeeds J. D. Wright, who has been appointed general manager of the chemicals division.

Mr. Clegg held responsible posts in a number of the company's agricultural chemicals plants, becoming works manager of the fertilizer plant at Hamilton in 1943. For a period



Clegg

following the war, at New Westminster, B. C., he was in charge of all production and sales of fertilizer for western Canada.

Since 1951, as

production mgr. of the agricultural chemicals division, he has been in charge of fertilizer manufacture at the company's seven plants in Ontario, Quebec and the Maritimes. During this period there has been a marked increase in plant food content of commercial fertilizers, accompanied by substantial advances in the manufacturing technology, including the development of the latest granular processes installed in three company plants last year.

Mr. Clegg is a councilor for the Montreal district of the Chemical Institute of Canada and was chairman of the chemical engineering group of the C. I. in 1956. He is active in a number of community activities.

Davidson-Kennedy

Davidson-Kennedy Company, Atlanta, Ga., designers and equipment manufacturers, has appointed Harrold Kitchens as manufacturers sales engineer. He will also represent Davidson-Kennedy Associates Company, Chicago Heights,

Ill., engineers and constructors. He will have offices in Macon, Ga.

Mr. Kitchens has had many years experience in the industry both in sales and technical capacities. Prior to his appointment by Davidson-Kennedy, he was associated with fertilizer engineering and manufacturing firms in the South and Midwest.



Kitchens

Chicago Heights, Illinois, manufacturers, has appointed Harrold Kitchens as manufacturers sales engineer. He will also represent Davidson-Kennedy Associates Company, Chicago Heights, Illinois, manufacturers,

Ill., engineers and constructors. He will have offices in Macon, Ga.

Mr. Kitchens has had many years experience in the industry both in sales and technical capacities. Prior to his appointment by Davidson-Kennedy, he was associated with fertilizer engineering and manufacturing firms in the South and Midwest.

Aylco



Lemler



Harper

Edwin Aylward, vice president, Aylco Fertilizer division of Unexcelled Chemical Corporation has announced the assignment of two assistants effective October 15. E. M. Harper, formerly midwest sales supervisor for Nitrogen Division, and R. A. Lemler, formerly midwest product supervisor, direct application solutions for Nitrogen Division, will serve as assistants to Mr. Aylward, the latter in charge of Sales Promotion and Advertising.

AP&CC

Dr. Donald S. Arnold has been named manager of research at American Potash & Chemical Corporation's main plant at Trona, Calif., according to an announcement by Joseph C. Schumacher, AP&CC vice president in charge of research.

Dr. Arnold succeeds Dr. Donald E. Garrett who resigned from the company recently to enter his own business.

Arnold previously was head of the high energy chemicals section of the AP&CC Henderson, Nev., plant research laboratory.

Quaker Oats

Robert W. Reardon has been promoted to Central region sales manager of the Quaker Oats Company's chemical division. He will be headquartered in Cleveland with offices at 815 Superior Avenue.

Reardon

In his new position, Mr. Reardon will be responsible for the sales activity in a territory which includes Ohio and West Virginia and portions of New York, Pennsylvania, Michigan, Kentucky, Tennessee, and Ontario, Canada.

Reardon joined Quaker in 1953 as a technical sales trainee in Chicago following three years employment as a chemist at Strong Cobb & Co., in Cleveland. One year later, he was named technical sales representative in the Cleveland area, a position he held until his recent appointment.

Federal Chemical



Sargent



Newman

John R. Sargent has been elected senior vice president for sales of Federal Chemical Company, Louisville, Ky. Mr. Sargent began his career with the company in 1915 and has been vice president for sales since 1945.

William Morris Newman has joined Federal as vice president for sales. He formerly was vice



Williams

president and treasurer of Price Chemical Company.

Lewis B. Williams, Jr. has been appointed chief agronomist of Federal. He has been agronomist for the Nashville Division of the company since 1953.

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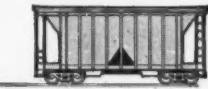
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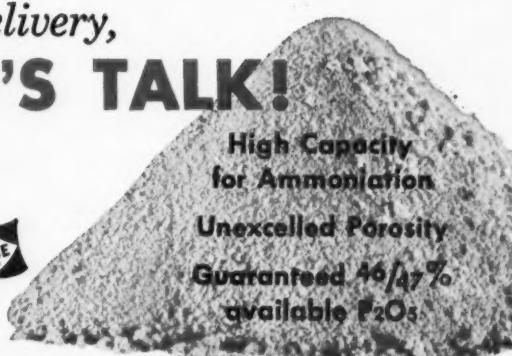
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Your IMC transportation service man is interested in your whole transporation problem . . . getting materials to your plant . . . out to your customers . . . on time and at low cost. He has a mission of total service. He awaits your call.

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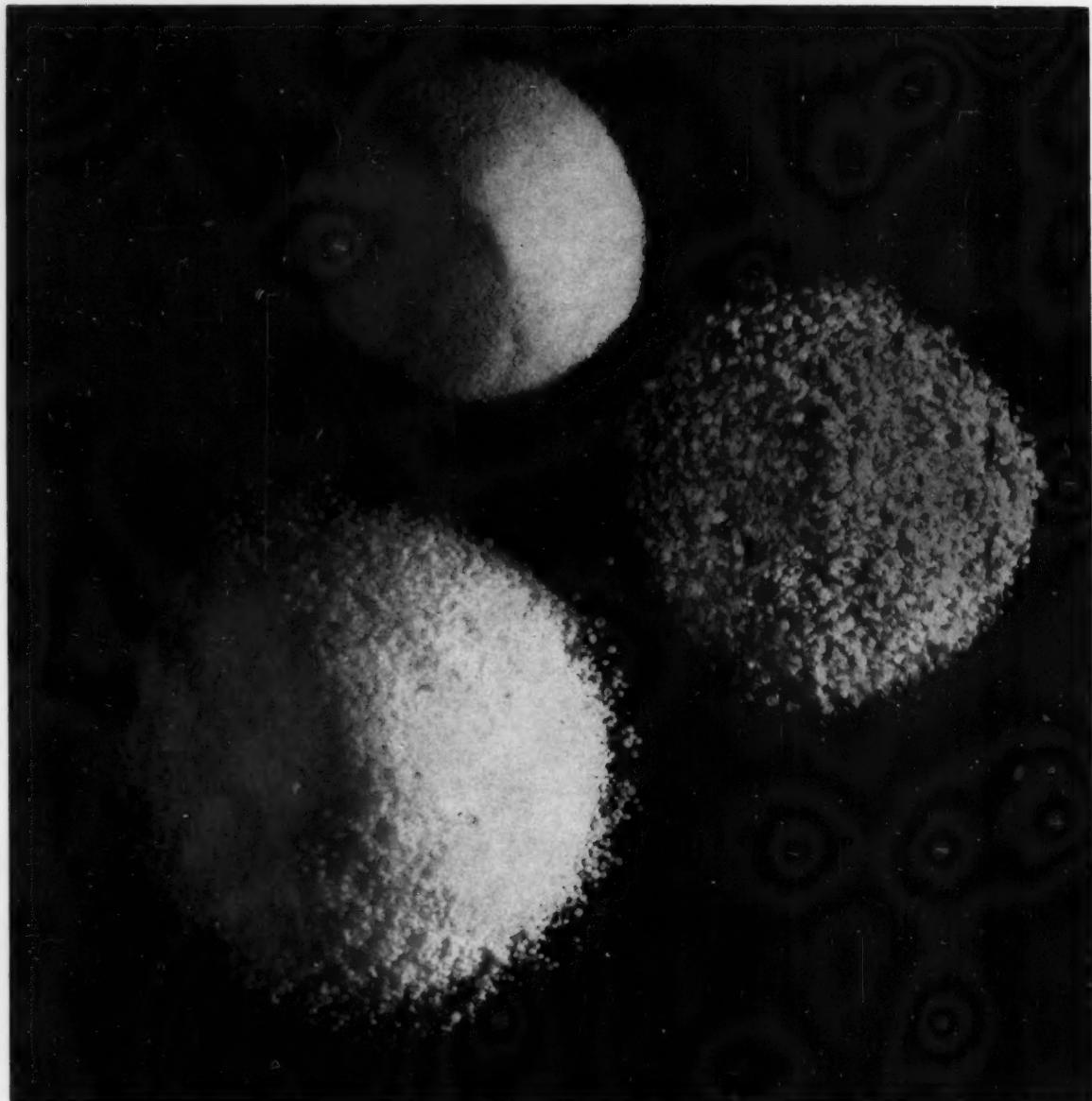
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muriate, containing 60% K₂O, is ideal for fertilizers requiring a still larger particle size. All three grades are specially refined to resist caking and remain free-flowing throughout.

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Spencer

C. L. "Chuck" Monson has been named to manage the new Northwest district sales office for Spencer Chemical Company's agricultural chemicals division. The recently-established office has its headquarters at 8401 West Dodge in Omaha, Nebraska.



Monson

Mr. Monson joined Spencer in 1948 and has served in a number of agricultural sales positions, including sales representative in the Southeast and in Iowa; product sales supervisor; and, prior to his new assignment, manager of national accounts. As manager of the Northwest district, he will supervise a sales area which includes the states of Iowa, Nebraska, Montana, North and South Dakota, Minnesota, and Wyoming.

The addition of five men to the sales and technical service staff of the agricultural chemicals division has been announced by Ray White, general sales manager. Three of the new men will be assigned sales territories, while the other two will be technical service representatives, Mr. White said.

The new additions are: Richard R. Redle—will become Michigan sales representative, reporting to the North-Central district office in Chicago. Donald C. Mitchell, Oklahoma sales representative in the Southwest district office in Kansas City. Julian F. Holloway, Arkansas sales representative, reporting to the Mid-South district in Memphis. Edward J. Hallacy, technical service representative in the Southwest district. Hubert L. Balay, technical service representative in the Northwest district.

Michigan Chemical

Michigan Chemical Corporation announces the appointment of George L. Innes as director of sales and development. Presently manager of the Chemical Sales and Development division of Climax-Molybdenum Company, New York, he will be in complete charge of Michigan's chemical sales and market development activities.

Mr. Innes has had wide research, market development and sales experience in the chemical and chemical processing industries.

Kickapoo Fertilizers

Midwestern Farm Fertilizers, Inc., and Midwestern Phosphate Corp. have moved their headquarters from Madison, Wis., to the Kickapoo Fertilizer Plant at Stevens Point, Wis. The firms operate another plant at Hillsboro, Wis. Phillip Q. Sawin has been named president of both concerns, with R. B. Baldrige as the new executive vice-president and general manager. The presidency has been vacant since July when Donald W. Aitken and his wife were accidentally killed on a Colorado trip.

Arizona Fertilizer

New plant manager for Arizona Fertilizer & Chemical Co. plant, Wilcox, Ariz., is Ken Tipling, according to Frank M. Feffer, Sr., president.

Commercial Solvents

Loy A. Everett has been appointed sales manager of Commercial Sol-



Everett

vents Corporation's agricultural chemicals sales department, according to an announcement by W. W. Jackson, vice president. Mr. Everett succeeds Clyde T. Marshall, who has resigned from the company.

For the past two years, Mr. Everett has been assistant sales manager of the department. In this capacity he has helped to develop marketing programs for the Company's expanded production of nitrogen fertilizers, including Dixsol Nitrogen Solutions and Hi-D ammonium nitrate sold to fertilizer manufacturers.

Mr. Everett's entire business career has been spent in fertilizer sales work. Prior to joining CSC, he was associated with the Virginia-Carolina Chemical Corporation.

Niagara Chemical

Dr. Oscar H. Johnson has been named assistant to division manager, Niagara Chemical Division, Food Machinery and Chemical Corporation. He comes to this position at division headquarters in Middleport, N. Y. from the New York City office of FMC where he has been director of research and development for the organic chemicals department. Dr. Johnson joined the FMC organization in 1946.

IMC

Otis W. Allen, 29-years with International Minerals & Chemical

Corporation, has been appointed research specialist in the company's research, engineering, and development division, with offices in the Florida AES, Mulberry.

Mr. Allen will concentrate on techniques toward producing higher analysis plant food materials and will serve as the division's expert on phosphate technology. He will report directly to the vice president of the research, engineering, and development division.

Mr. Allen has been associated with the Bonnie, Florida, chemical plant since 1950, when he was placed in charge of coordination of planning, engineering, and construction.

Mississippi Chemical

Owen Cooper, who is board chairman of First Mississippi Corp., and executive vice-president of Mississippi Chemical, has been named president and board chairman of First DeSoto Corp., Hernando, Miss. which will develop into a model city of 35,000 people, 2,754 acres of land in DeSoto County in the Horn Lake area.

Royster Guano

William G. Hewitt, marketing analyst for The Bunker Hill Company, has been appointed assistant to the president it was announced Oct. 13 by John D. Bradley, president.

The position has not been filled since the departure of James P. Blaisdell. Charles E. Schwab also held the title, but has devoted virtually all his time to chairmanship of the industry's Emergency Lead-Zinc Committee. He becomes general manager of Kellogg Operations on January 1.

Prior to his employment with Bunker Hill in October of 1958, Mr. Hewitt was president of the Pacific Guano Company in Berkeley. He had also been vice president of Pacific Chemical and Fertilizer Company in Honolulu, where he started work in 1941.

Royster Guano

Edwards C. Burks has left N. C. State College information bureau to head a public relations department for F. S. Royster Guano Co., Norfolk, Va.

ACRICO

James G. Link, Jr. has been named a Southern regional agronomist for The American Agricultural Chemical Company, it has been announced by Dr. D. P. Satchell, manager of agronomic services for the company.



Link

Mr. Link was awarded a M.S. degree in agronomy by Alabama Polytechnic Institute, Auburn, last June. His work leading to the Master's degree concerned the residual effects of applied phosphates, and was conducted under Dr. L. E. Ensminger at API.

In his work with Agrico, Mr. Link will be located at Montgomery, Ala., and will be in charge of agronomic service work at Agrico's offices at Montgomery, Pensacola, Fla., and Nashville, Tenn.

K. R. Hedrick has been named production superintendent at Agrico's manufacturing plant at East St. Louis, Ill., according to an announcement by D. S. Parham, vice president in charge of production. Mr. Hedrick, who was formerly superintendent at Danville, Ill., replaces R. T. Green, who has resigned.

D. S. Kirk was named production superintendent at Danville, replacing Mr. Hedrick. He was formerly located at Agrico's Humboldt, Iowa, plant, where he was assistant superintendent.

Wilmington Fertilizer

Edwin Pate has been re-elected president of the Wilmington Fertilizer Co., Wilmington, N. C. and Herman N. Hayden Sr. was moved up to executive vice-president and treasurer. Other officers: George Sloan, Jr., production vice-president; F. A. Yarborough, sales vice-president; R. M. Padrick, Jr., secretary (see Map).

Price Chemical

Two management changes in Price Chemical Co., Louisville, Ky., were announced by John A. Miller, president.

Marion J. Smith has been promoted to general manager. He has been with the company for seven years.

Ralph E. Smith has been advanced to the post of production manager. He has been with Price for 11 years.

Davison Chemical

William A. Lorenz has been named traffic manager for the mixed fertilizer division of Davison Chemical Company division of W. R. Grace & Co. He has been assistant traffic manager for three years, and was promoted to his new position after the retirement of George Kraus, former traffic manager. Mr. Lorenz joined Davison at the Columbus, Ohio plant and was transferred to the Baltimore office in 1953.

Shuey & Co.

Sidney L. Waldhour, Jr. has joined Shuey & Co., Savannah, Ga., analytical and consulting chemists who are expanding their laboratory and services. Mr. Waldhour, experienced in testing a wide range of products and materials, has



Waldhour

resigned as Test Engineer for the Central of Georgia Railway to accept the new post. Shuey & Co. dates to the close of World War I.

Climax

E. E. Smith has been appointed manager of Climax Molybdenum Company's Chemical Division, it was announced by Reuel E. Warinner, vice president—sales.

In his new post, Mr. Smith will direct all chemical sales and development activities for Climax. This covers a wide range of materials including: lubricant additives; catalysts; pigments; corrosion inhibitors; agricultural chemicals; and numerous intermediate and development chemicals.

Delhi-Taylor

Dr. Elton Soltes, who has headed potash developments in southeastern Utah for Delhi-Taylor Oil Corp.,

Dallas, Tex., has been named manager for special projects and planning division of the firm, succeeding J. W. Bartlett, retiring vice president.

Sunshine

B. E. Adams has been elected president of Sunshine Plant Food Co., Clovis, N. M., with executive offices in the Exchange Bank Bldg., Dallas, Texas. Mr. Adams joined Sunshine as executive vice president in June, 1958.

E. F. "Bud" Williams of Clovis, former president, was named chairman of the board, and Jamie F. McFarland, Dallas, was elected secretary-treasurer.

N. W. Cooperative

Roger Olmsted, plant manager of Northwest Cooperative Mills fertilizer and phosphate plants at Green Bay, Wisconsin has been promoted to fertilizer division manager with headquarters in St. Paul, Minnesota.

He succeeds W. E. Jones, elevated to general manager of the company on September 1.

Crop Service Co.

Three Belgian industrialists recently visited the Crop Service Co. liquid fertilizer plant near Champaign, Ill. They are: L. C. Coenen, H. Jungles and R. Lombers, all officers of the Belgian nitrogen concern,—Societe Belge de Lazote. They are in America to study fertilizer production methods.

DuPont

George E. Miner has been made West Coast representative for DuPont garden products, a new post, according to the manager of the garden products section, Howard A. Weibel.

Industry Meeting Calendar

DATE	EVENT	LOCATION	CITY
Nov. 4-6	Fertilizer Industry Round Table	Mayflower Hotel	Washington, D. C.
Nov. 5-6	Far West Safety School	Hacienda Motel	Fresno, Calif.
Nov. 8-10	Natl. Fertilizer Solutions Assn.	Statler Hilton	St. Louis, Mo.
Nov. 9-11	California Fertilizer Association	Fairmont Hotel	San Francisco, Calif.
Nov. 12-13	Southwestern Safety School	Tropicana Motor Hotel	Pasadena, Texas
1960			
Jan. 13-15	Agricultural Ammonia Institute	Statler Hilton Hotel	Dallas, Texas
Feb. 11-12	Midwest Industry-Agronomist Meet	Edgewater Beach Hotel	Chicago, Ill.
June 12-15	National Plant Food Institute	Greenbrier Hotel	White Sul. Spgs., W. Va.
July 27-30	Southwest Fertilizer Conference	Galvez Hotel	Galveston, Texas

INDUSTRY CHANGES

GRACE & CO. MANAGING GONZALES

W. R. Grace & Co. of New York and Gonzalez Chemical Industries, Inc. of Puerto Rico signed a contract Oct. 13 under which Grace will manage and operate the Gonzalez ammonia and ammonium sulfate plant located at Guanica, Puerto Rico.

The management contract is a first step in a contemplated reorganization of Gonzalez Chemical Industries, Inc., in which it is expected that Grace will acquire a substantial amount of stock in the Puerto Rican company. Negotiations to this effect are continuing.

Under the management contract, Grace will supply managerial, administrative and technical personnel, technical know-how and production services.

The Gonzalez plant was designed and built by the Lummus Company of New York in 1956. Design capacity is 125 tons per day of ammonia and 350 tons per day of sulfuric acid which are combined to make over 400 tons per day of ammonium sulfate used as a fertilizer for the island's important agricultural economy.

The plant, built at a cost of more than \$12 million, is the first and only ammonia-ammonium sulfate plant in Puerto Rico and was built to make the island more self-sufficient as a basic chemical producer for industry and agriculture.

The plant utilizes crude oil as a starting material. It is one of the world pioneers of the Texaco Partial Oxidation Process for manufacturing ammonia from crude oil. Grace also uses this process at its 300 tons per day ammonia plant in Memphis, Tennessee, but employs natural gas as a starting material.

The Gonzalez plant converts sulfur into sulfuric acid employing the Leonard-Monsanto process. Grace uses this sulfuric acid process at its own superphosphate plants in Bartow, Florida, and Curtis Bay, Maryland. It also will use this process in an ammonium sulfate plant now being completed in Trinidad.

Several top officials of the Grace Chemical division at Memphis, Tennessee, a major producer of ammonia and urea, were appointed to key positions at the Gonzalez plant.

They assumed their new duties at Guanica immediately after signing of the contract in New York.

William J. Haude, president of Grace Chemical Division, announced that under the contract all production matters will be supervised by John G. Garriere, vice president of the Grace Chemical division. Mr. Harold S. King, controller of the same division, will handle all financial and organizational matters.

The following appointments were made:

Lloyd E. Lundahl, formerly manager of engineering and maintenance of the Grace Chemical division at Memphis, is the new manager of the Gonzalez plant. E. H. Culp, previously assistant manager of the ammonia department at Memphis, is assistant plant manager. C. L. Weeks is project manager. C. P. Rhys is operating superintendent. D. S. Sharpe, until now manager of maintenance at Memphis, is superintendent of maintenance. Peter D. Chabris, assistant director of industrial relations of W. R. Grace & Co. (Caribbean Area), is in charge of industrial relations.

H. J. Baker & Bro.

H. J. Baker & Bro., has been appointed exclusive U.S. agent for the urea production of Comptoir Belge de l'Azote, Brussels, Belgium.

The Belgian firm, also known as Cobelaz, is one of Europe's largest producers of nitrogen.

In addition to supplying urea for fertilizer, feed, and industrial users in the U.S., H. J. Baker will also serve as agent for Puerto Rico, Cuba and the Dominican Republic.

I.C.I. Gets S.B.A. Process

The Imperial Chemical Industries Ltd. (I.C.I.) and Societe Belge de l'Azote et des Produits Chimiques du Marly (S.B.A.), Liege (Belgium) recently concluded an agreement, according to which S.B.A. grants to I.C.I. the license of its process for ammonium nitrate granulation.

This process is applied by S.B.A. in its own plants and moreover is used in many other units erected abroad by the S.B.A. engineering division for various important chemical companies.

Ferro-Cummer

An agreement for the sale and distribution of FTE—Ferro Fritted Trace Elements — throughout the State of Florida has been signed between Ferro Corporation, Cleveland, O., and the Cummer Lime and Manufacturing Company of Jacksonville, Florida, according to an announcement by Gene L. Bruton, manager of Ferro's Agricultural Division.

Under the new agreement Cummer will continue to market Tracel Limestone as well as acting as manufacturer's representative for FTE in Florida. They will actively promote the sale and use of FTE both as a straight product and as an additive for fertilizer throughout Florida.

Tamms

Tamms Industries Co., Chicago, has appointed L. H. Herr Co., Denver, Colo. to represent their raw materials division in Colorado and parts of Wyoming and New Mexico.

BOOKS

Garden Handbook by Potash Institute

The American Potash Institute has issued a new handbook entitled "You Can Grow a Good Garden," with leading material from such authorities as Dr. E. C. Fisher, Cornell; Dr. Tokaji Furata, Auburn; Dr. Norman F. Chilدرس, Rutgers; Henry J. Smith, Mississippi State; Dr. Wesley P. Judkins, Virginia Poly and Dr. John Carew, Michigan State.

Write for a copy to News Service, American Potash Institute, 1102 16th St. N.W., Washington, D. C.

CFA Gives Bankers Booklets

Agricultural area bankers of California were recently supplied with copies of the booklet "More Profits from Fertile Soils in California" for distribution to their loan officers and farmer customers. This booklet, prepared by the National Plant Food Institute and the California Fertilizer Association, contains pertinent economic data supplied by the University of California which shows that proper fertilization can raise profits and cut unit production costs.

Nitrogen Solutions Booklet

'Nitrogen Solutions' is the title of a new booklet being offered by Commercial Solvents Corporation to those concerned with the production of fertilizer. The two-color, 24-page booklet covers types and uses of nitrogen solutions, ammoniation of superphosphates, ammoniation practice, granulation, formulation, storage of finished fertilizer, safety precautions, first-aid measures and reference tables.

In addition, the new letter-size booklet gives data on CSC's 'Dixsol' Nitrogen Solutions, along with information on the shipping, handling and storage of these solutions.

If you are concerned with the production of fertilizers, just circle

number 1 on CF's Information Service card, page 51, for your free copy of this booklet.

General American Catalog

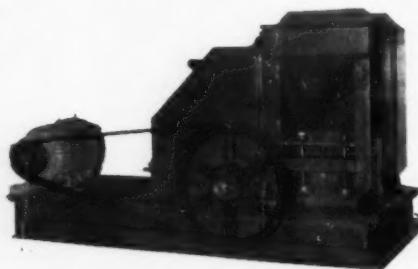
A new 1960 catalog covering services and products for the process industries is being offered by General American Transportation Corporation. Among the products featured in the 20-page edition are their Louisville dryers, tank cars, covered hopper cars, tank storage terminals, turbo-mixers, and custom fabrication.

For a free copy of the new General American catalog, circle number 2 on CF's Information Service card, page 51.

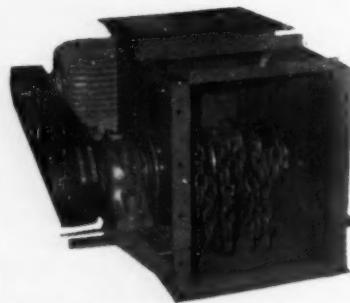
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No. 137-F Swing Bar Pulverizer



NO. 214-F Chain Type Pulverizer—30" x 18"—1000RPM—20HP—1525#

Cage Mill Sizes:

109-F 30" St'd. Duty 2- 5HP Motors—	2930#
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110-F 42" Heavy Duty 2- 10 or 15 HP Motors—	4500# or 4635#

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Plastic Nozzles

A new line of nozzles made entirely of P.V.C. has just been an-



nounced by Bete Fog Nozzle, Inc. For use wherever a non-metallic, corrosion proof nozzle is required, the new nozzles are claimed to be non-clogging and long wearing.

Made from one piece of P.V.C. plastic, using the manufacturers patented spiral design, these new "PV" series nozzles are inexpensive, according to the manufacturer, and are available in 28 models with wide or narrow angle, full or hollow cone and seven different flow rates from 2 to 70 gpm.

For further information circle number 3 on CF's Information Service card, page 51.

Speed Reducers

Information on industry's most complete line of helical gear speed reducers is contained in Book 2751, just published by Link-Belt Company. This new 20-page book consolidates all of the company's expanded line of In-Line helical gear speed reducers in a single catalog.

"In-Line Helical Gear Speed Reducers" provides complete selection data on 20 reducer sizes in double, triple and quadruple reductions.

Book 2751 contains tables of load classes and service factors for all In-Line helical gear speed reducers. Horsepower and torque ratings, dimensions, overhung load for high and low speed shafts, and mounting arrangements are given along with a resume of construction features.

The new publication also contains selection information on motor couplings and geared flexible couplings designed for use on Link-Belt's In-Line helical gear speed reducers.

A copy of Book 2751, "In-Line Helical Gear Speed Reducers," can be obtained by circling number 4 on CF's Information Service card, page 51.

Dry Materials Feeder

The Omega Hi-Weigh Belt Gravimetric Feeder, a medium to high capacity feeder for continuously weighing and feeding dry materials at high rates, is the subject of a new bulletin released by B-I-F Industries, Inc., manufacturers of process instrumentation, equipment and systems for control of materi-

FREE LITERATURE ON EQUIPMENT MATERIALS AND SUPPLIES

als in motion.

The four-page, two-color bulletin contains several photographs of the Omega Belt Gravimetric Feeder, Model 37-20, and a cutaway view illustrating the patented Sens-A-Gram, a mechanical controller which instantly responds to the slightest deflection of the weight sensing section of the feed belt. Also included are installation photographs, dimensional drawings, a list of accessories, and a description of the advantages and operation of the feeder.

For your free copy of Bulletin 35.20-2, circle number 5 on CF's Information Service card, page 51.

Hopper Car Coatings

A coating made of polysulfide liquid polymer and epoxy resin has solved a major maintenance problem for fertilizer and chemical-carrying railroad hopper cars, according to Thiokol Chemical Corporation. The coating provides protection against corrosion for steel cars and withstands abrasive action of dry chemicals and fertilizers. Such coatings have about ten times the

life of previously used coatings, Thiokol reports.

After being in service for three years—carrying muriate of potash—the polysulfide liquid polymer and epoxy resin coating was inspected and reported to be in excellent condition. It is expected that these cars will be in service for at least five years without need of additional coating or painting.

For further information, circle number 6 on CF's Information Service card, page 51.

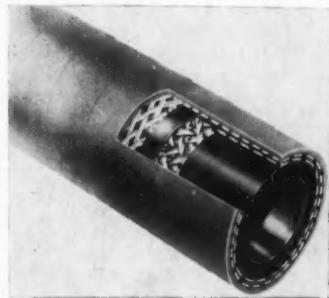
To 300 P.S.I. Ammonia Hose

Two constructions of agricultural ammonia transport hose are available from Raybestos-Manhattan Inc., both designed to withstand working pressures to 300 psi and to meet state safety regulations for the use of anhydrous ammonia. The company also offers an ammonia applicator hose.

Paranite BW Ammonia Hose is heavy duty, braided wire construction for loading storage tanks, trucks and tractors. A corrosive resistant steel wire braid and a strong cord braid are applied at controlled angles to withstand high pressure and to minimize elongation and contraction due to changes in pressure. Though the hose is rugged it is claimed to be flexible and easy to handle. A tough, pliant neoprene cover is designed to resist weather and ground scuffing. Available in sizes $\frac{3}{8}$ " to 2"; 50' lengths.

Homoflex Ammonia Hose is a braided ply construction for filling tractors and for feed lines. Super-strength cord braids are applied at a precision balanced angle to achieve extreme flexibility. "Flexible as a Rope" is the claim made by the manufacturer. Special neoprene cover is designed for long life without cracking and weathering. Available in sizes $\frac{1}{4}$ " to 2"; 50' lengths.

Manhattan Ammonia Applicator Hose is designed for soil applicators to carry the anhydrous ammonia to the tip of the tractor applicator. Built to withstand constant flexing and vibration of the applicator, it is available in 3/16" to $\frac{1}{2}$ " sizes in long lengths.



For more data contained in catalog M680, circle number 7 on CF's Information Service card, page 51.

Rotary Paddle Feeder

A new Rotary Paddle Feeder designed to assure even, uninterrupted flow of non-flushy ground and small-size granular materials by eliminating pile-up or packing is the subject of a new product data sheet released by Richardson Scale Company.

The new two-page data sheet contains information on special features of the rotary paddle feeder, including in-line feed and discharge, which permits installation directly below a bin, spout or storage hopper, thereby saving floor space.

Illustrated with photographs and an isometric drawing, the data sheet gives complete specifications for the two sizes available.

For copies of Product Data Sheet No. 5901 circle number 8 on CF's Information Service card, page 51.

Urea Fact Sheet

The Chemicals Division of Olin Mathieson Chemical Corporation has published a four-page fact sheet on Mathieson Urea.

The brochure shows availability of Mathieson Urea in the East through the North Claymont, Del. plant and also points up major engineering improvements designed to produce highest grade prilled and crystalline urea.

The urea will be produced by SunOlin Chemical Company, jointly owned by Sun Oil Company and

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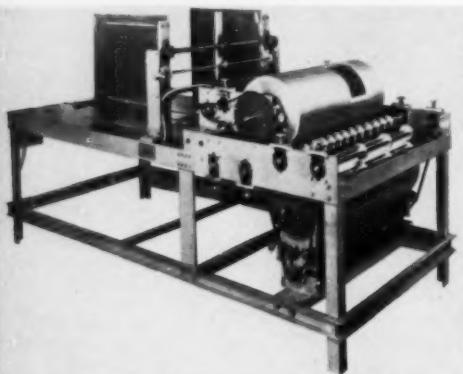
CITY _____ ZONE _____ STATE _____

Olin Mathieson. Start-up of the 73,000 ton per year capacity plant is scheduled for the spring of 1960.

Copies of the urea fact sheet and further information on Mathieson Urea may be obtained by circling number 9 on CF's Information Service card, page 51.

New Bag Printer

A new package and product marking unit which claims commercial-quality printing, coding and



marking on production line operations has been developed by Industrial Marking Equipment Company.

The 'Flexo-Printer' can print multi-wall bags or knocked-down cartons of any size, handling both top and bottom simultaneously, and printing anywhere on the bag or carton. Production speeds are up to 35 per minute with 36 by 48-inch cartons, and 3600 per hour, or to individual requirements with smaller sizes, and a magazine feeding system offers individual hand wheels for width and thickness adjustment.

The remarkable improvement in print quality achieved by the Flexo-Printer is due to Industrial Marking's development of a flexographic inking system said to be superior to any other now available.

In this system, a rubber roll runs constantly in a bath of ink, then comes in contact with an engraved steel metering roll, hard chrome plated and polished for extra long life, even at high speeds. This metering roll in turn applies the ink film to the precision rubber type on a roller made of specially cured and ground rubber.

The ink supply is kept full simply by pouring additional ink into the open fountain. Printing impressions are uniform, with no blurring of impressions.

The Flexo-Printer, besides handling standard bag or carton marking applications, can be adapted to meet any special product handling or positioning problem.

For further information circle number 10 on CF's Information Service card, page 51.

Process Equipment Catalog

Manning & Lewis Engineering Co. has announced availability of a new 8-page catalog which describes and illustrates the company's line of chemical process and heat exchange equipment.

The catalog spells out in detail Manning & Lewis's product line and describes the company. The brochure presents a representative showing of heat transfer equipment, reactors, mixers, kettles and special process machinery manufactured by Manning & Lewis. Illustrations support the text matter.

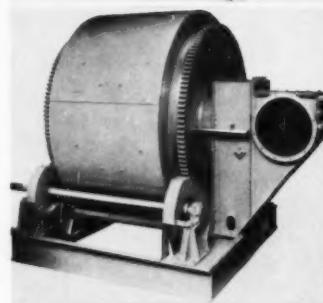
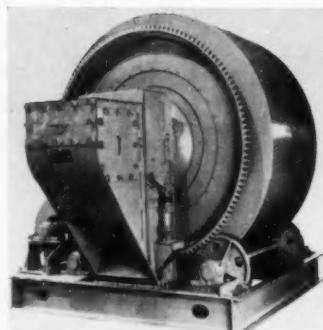
Copies of this brochure are available by circling number 11 on CF's Information Service card, page 51.

Remote Control Mixer

A remote-controlled, air-cylinder-actuated fertilizer mixer, with a capacity of up to two and a half tons per batch (50 to 65 tons per hour), and specially engineered to eliminate the need of spout and elevator at point of discharge—the unit feeds directly into a granulator-cooler—has been designed, engineered and fabricated by Sturtevant Mill Company.

Sturtevant's use of extra-heavy gauge steel for construction of the new mixer eliminates former requirements for high-cost stainless steel at all contact points. Some parts, such as the specially-engineered introduction-discharge hopper, remain fabricated of stainless. The revolving scoops of the cylindrical mixer, which play an important part in Sturtevant's four-way mixing action, are fabricated of Corten steel, another engineering first.

The open-door aspect of all Sturtevant machinery, which enables one-minute accessibility to all moving parts of every unit, is inherent.



to this mixer. Newly-engineered, however, is the acid gas vent located above the extended stainless steel introduction-discharge hatch area.

This special venting allows immediate expulsion of hot corrosive fumes during the mixing process, affording a preliminary partial drying and cooling action as well as reducing corrosive action within the mixer itself. Thus, immediate discharge into a granulator-cooler, bypassing a spout and elevator, can be achieved successfully, eliminating initial purchase and continuing maintenance costs of such additional equipment.

The new mixer is available in capacities of from a quarter ton per batch (4 to 7½ tons per hour) to the 50-65 ton per hour mixer.

For full information, circle number 12 on CF's Information Service card, page 51.

Electrical Corrosion Inhibitor

An inhibitor that displaces and seals out water and moisture, protects metal surfaces against corrosion, and lubricates is the subject of a new six-page illustrated folder just released by Corrosion Reaction Consultants.

Called CRC 2-26, this liquid formula has been especially developed for manufacturing and maintenance use in the electrical and electronic equipment fields. It is claimed to improve characteristics and performance, eliminates failures due to water or moisture, and restores equipment to use after flooding or corrosion.

The folder includes an explanation of how CRC 2-26 works, its benefits, advantages and applications, factual case histories and details on its physical specifications.

For free copies circle number 13 on CF's Information Service card, page 51.



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Information Service Bureau

Commercial Fertilizer and Plant Food Industry

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Reinforced Plastics Brochure

Indust, the reinforced plastics division of Industrial Sheet Metal Works, has published a new brochure covering the applications and advantages of their reinforced fiberglass plastics in designing corrosion resistant industrial fume and dust control systems.

The brochure deals with physical properties of reinforced plastics such as strength, temperature range, fire resistance, translucence, thermal and electrical conductivity, bonding characteristics and similar factors.

Ducts, hoods, stacks and other applications of reinforced plastics are illustrated along with machining, drilling, welding, and other fabricating methods to which the material lends itself.

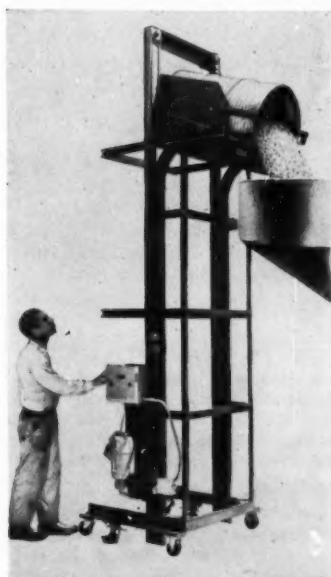
Copies of the brochure may be obtained by circling number 14 on CF's Information Service card, page 51.

Drum-Bag Elevator Dumper

A time and labor saving device for lifting and dumping drums or bags has been announced by Conveyors and Dumpers, Inc. The unit is designed for low-cost batch loading of mixers, blenders, tanks, bins, and similar equipment.

Termed the Cesco Jr. Model DU, the conveyor lifts and dumps a variety of standard size drums. It can also be adapted to lift and discharge bags.

Available in capacities to 400 pounds and dumping heights to 12 feet, models are stationary or portable. Variations can be designed



for other heights and capacities.

For further details, circle number 15 on CF's Information Service card, page 51.

Protective Coating

Prucoat Laboratories, Inc. announces availability of newly-developed Prufcoat Primastic, a protective coating that combines rust-inhibitive primer properties with the chemical resistance of a catalyz-

ed epoxy coating. According to Prufcoat technicians, the new product, by affording both primer and topcoat corrosion-control qualities, performs functions formerly requiring the use of two materials.

This new product is said to withstand severe corrosive exposures and to make one-coat protection possible for process equipment in the chemical.

Prucoat Primastic requires only one brush or single-pass spray coat for a coating up to 10 dry mils in thickness. One cross-pass spray coat yields 20 mil dry film thickness. Its cost per mil foot barely exceeds one cent. Flash point exceeds 100° F.

The company contends that Prufcoat Primastic application requires 'only minimum surface preparation.' Sandblasting is rarely necessary. No special equipment is needed, and the new product can be applied by a company's regular maintenance forces.

For full detail, circle number 16 on CF's Information Service card, page 51.

Hopper Vibrator

Martin Engineer Company, originators of the Vibrolator line of vibrators, have announced a new concept in electric vibrators. A new mounting aspect puts the vibrational orbit close to and parallel with

All-Iron SELF-PRIMING CENTRIFUGAL PUMPS FOR LIQUID FERTILIZER

A black and white photograph of a vintage-style truck with a large cylindrical tank mounted on its bed. The tank is labeled "Liquid Mixed FERTILIZER". A pump unit is attached to the front of the truck. An inset circular image shows a close-up view of the pump mechanism.

- Low Cost
- Light Weight
- Greater Volume
- Compact

FLOMAX 8, All-Iron Self-Priming pump mounted on this Farm Crop Foods Inc., tank truck supplies plenty of volume and the correct pressure for field spraying. FLOMAX pumps from 5,800 to 15,900 GPH are also used for bulk transfer, for unloading tank cars and for general purpose pumping.

MP Pumps—the FLOMAX SELF-PRIMING CENTRIFUGALS—Engine Driven (or belt or electric motor drive) are now the standard for pumping Liquid Fertilizer.

The Open Adaptor: Liquid being pumped can never touch the engine shaft or bearing or get into the engine itself.

The greaseless Seal: covered by fluid at all times. Never needs lubrication.

Continuous, uninterrupted operation is absolutely important. You must not have interruption of pumping during the handling or application of liquid fertilizer. You have continuous performance operation with the MP FLOMAX series.

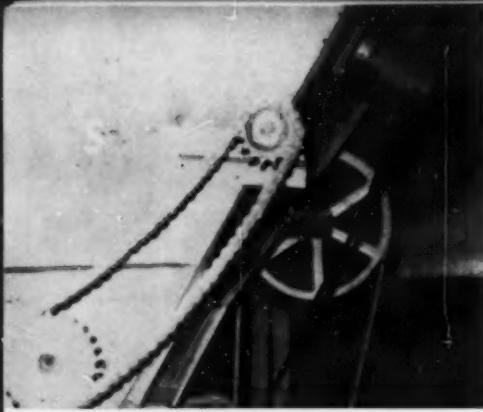
All-Iron
for
Liquid Fertilizer

FLOMAX 5.... 5,800 GPH
FLOMAX 8.... 8,400 GPH
FLOMAX 10.... 11,100 GPH
FLOMAX 15.... 15,900 GPH

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hopper wall, eliminating need for reenforcing plate on thinnest hopper materials. Quick clamp mounts can be furnished for jobs where vibrator must be moved from place to place or brought indoors for protection against theft.

Designated the DHE-111 "Magnetic" electric vibrator, this unit offers stepless speed control from 2,000 to 10,000 VPM while operating. DHE-111 is designed for quiet, powerful vibration on the most difficult installations.

The unit has forced air cooling and fully enclosed electrics. This allows use on jobs where no other rotary electric vibrator could be expected to hold up. Operation is on 115V. AC-DC through a simple rheostat.

For further details, circle number 17 on CF's Information Service card, page 51.

Quick-Service Soils Analysis

A new soils analysis service that sends back test reports two days after receipt of sample, and costs from \$1 to \$2 per sample, depending on volume, is now available from the laboratories of United States Testing Company, an independent testing and research laboratory serving agriculture, industry and commerce. Price per sample depends on the number of samples submitted during one year.

This low-cost, high-volume service is of particular interest to fertilizer manufacturers, distributors, farm consultants, and large farm corporations. Service can be tailored to meet the specific needs of any particular organization.

As many of fertilizer firms offer analyses as part of their customer service, United States Testing Company claims it can handle this volume-type business quickly from them and at new low unit costs. Soil analyses are done using well-established, rapid, analytical techniques suited to the area from which the samples came.

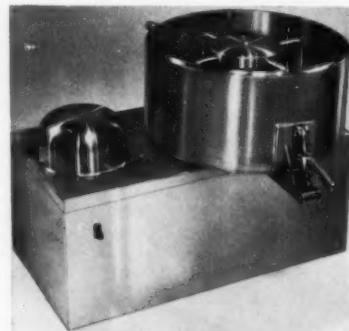
For more information, circle number 18 on CF's Information Service card, page 51.

Small Turbine Mixer

A new type pilot-plant size turbine mixer has been announced by T. L. Smith Company, manufacturer of industrial mixers.

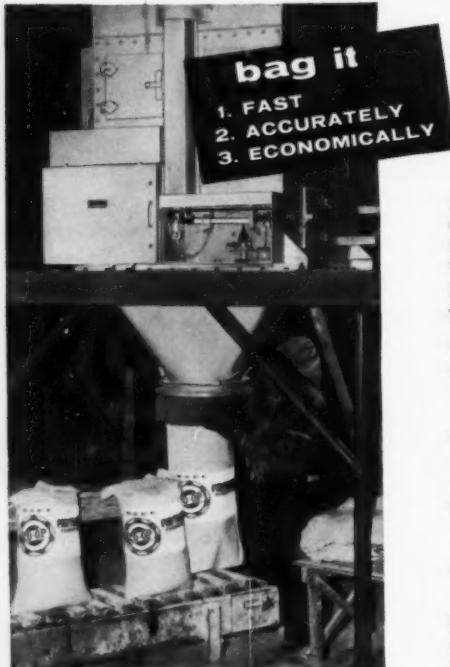
The new mixer has a capacity of $\frac{1}{2}$ cubic foot, making it suitable

for pilot work or feasibility tests in chemical plants. The unit is highly portable, requires no fixed mounting, is light enough to be carried by two men, and can be quickly shifted from location to location within the plant to furnish on-the-spot pilot mixing.



The unit is designed for either wet or dry blending, as well as slurry mixing. The unique doughnut-shaped pan has no dead spots, and the high-speed rotary action mixes faster, more thoroughly than other mixers without grinding, crushing, or altering particle size of the ingredients.

Stainless steel construction makes the mixer corrosion resistant and increases the range of chemicals which can be mixed. The mixing bowl is jacketed for heating or



Richardson HA-39 Fertilizer Bagger

Any fertilizer manufacturer using a Richardson HA-39 Bagger can check off all three as well done! Richardson leads the field in all requirements for fertilizer bagging equipment. Here are some of the reasons you can look to Richardson for more efficient fertilizer production.

The Leader!

- **SPEED** — Up to twenty-four bags a minute. Capacity 50 to 125 lbs.
- **ACCURACY** — Over two million test weighings proved the Richardson HA-39 Bagger accurate to within an average of 2 ounces!
- **ECONOMY** — Saves time (high speed operation).
Saves labor (fully automatic).
Saves materials (prevents overweights).
- **SIMPLICITY** — Only 5 basic components, (frame, chute, feeder, beam system with hopper, bagging spout) . . . easy to operate, easy to maintain.
- **RUGGEDNESS** — Stainless — heavy gauge plate, life tested. Dust tight housing. Built for fertilizer use. Weight over 2400 lbs.

Backed by 55 years of experience in automatic weighing. For complete details ask for Product Data Sheet 5601 with complete specification list.

Richardson Scales conform to U. S. Weights and Measures H-44 for your protection

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Sales and Service Branches in Principal Cities
Also manufactured in Europe to U.S. standards

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MATERIAL HANDLING BY WEIGHT SINCE 1902

cooling with steam, hot or cold water, or refrigerants.

Other design features include a variable speed drive for positive control to match changing requirements; and an over-center door lock that provides a liquid tight seal on the bottom-dumping door. The $\frac{1}{2}$ hp unit uses 220 AC, 3 phase current.

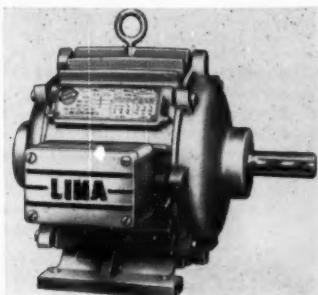
For more information, circle number 19 on CF's Information Service card, page 51.

Enclosed Fan-Duty Motors

Lima Electric Motor Company has announced availability of its Type EFD Fan Duty Motor in rated NEMA frame sizes 182 thru 326U, ($\frac{1}{2}$ thru 15 H.P.). These motors are furnished in speeds of 1800, 1200 or 900 rpm as required.

Lima 'air-over-motor' fan duty motors feature in addition to totally enclosed housings, deep external cooling fins that assure adequate cooling with a reduced transverse section to give lowest wind resistance. All cooling surfaces are readily accessible for cleaning if necessary. Duty rating is continuous and temperature rise is rated at 55° C.

Other construction features of rated Lima Type EFD Motors are: rigid, seasoned cast iron frames with integral feet; die cast rotors, dynamically balanced; double-width pre-lubricated sealed ball bearings. Windings are heavy multi-coated insulated wire which provide high dielectric and mechanical strength. Stators are impregnated with moisture resisting, thermosetting varn-



ish and baked in temperature controlled ovens. Uniformity of air gap between rotor and stator is accurately maintained. Stators are tested in accordance with NEMA specifications. Roomy connection box can be rotated to make connecting easier.

Lima Type EFD Motors are available for 3 or 2 phase operation in all standard frequencies and commercial voltages below 600 V, as required.

For complete information on Lima Type EFD Motors, circle number 20 on CF's Information Service card, page 51.

New Wheel Loader

An industry first—two types of transmission available with a single model front-end wheel loader—has been announced by Allis-Chalmers Mfg. Co. Model TL-14 TractoLoader

is now available with either the Allison transmission, or the new, economical Tractomatic power reversing transmission.

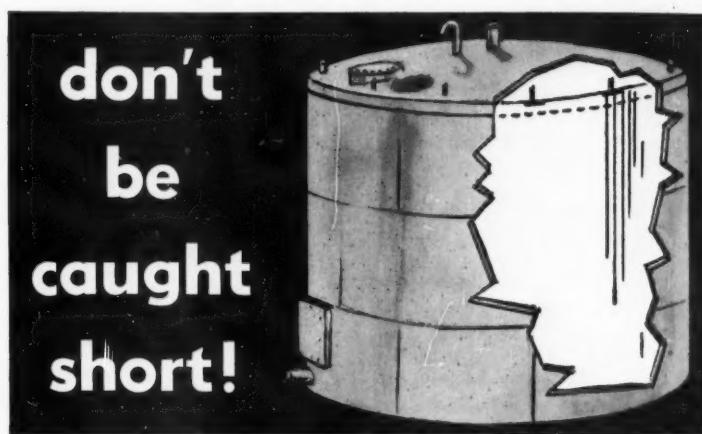
The four-speed Tractomatic transmission reduces initial capital outlay for a wheel loader without sacrificing essential advantages; a single hydraulically operated steering column lever controls both forward and reverse movement without clutching, shifting gears, or stopping the machine.

First gear offers a forward speed of 3.2 mph and reverse speed about 30% higher, which has the effect of automatically selecting a higher gear when going into reverse; first gear is recommended for operations such as stripping or digging except-

tionally hard packed material.

Second gear is utilized for general loading. When loading, the machine moves into the pile at 4.8 mph, providing maximum power; reverse speed of 6.3 mph provides the added speed needed to reduce cycling time. Third and fourth gears offer even higher speeds. Gear operation is completely mechanical. Model TL-14 is available with either an 86 hp 6-cylinder gasoline engine or an 83 hp diesel engine.

Model TL-14 TractoLoader with Tractomatic transmissions are equipped with a hydraulic twin-disc 3.2 to 1 ratio torque converter, and with an automatic clutch cut-off, which has the effect of placing the transmission in neutral and thereby di-



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every FLEXI-LINER. Widely used in the chemical industry, FLEXI-LINERS have already built a reputation for long-life and economy.

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HONORS: Clare W. Jarvis, assistant sales manager of Canadian Industries Limited agricultural chemicals division, is shown admiring the camera presented to him by his colleagues at a recent reception in Toronto when he retired from the company after 43 years in the fertilizer business. Shown with him are: J. W. Thompson, sales manager; V. B. Lillie, general manager; L. V. Clegg, production manager; H. G. Sewell, sales manager—fertilizer; Mr. Jarvis; Sam Cree, manager C-I-L's Norwich, Ont. fertilizer plant; and G. B. Ough, Chatham, Ont. district sales manager. Mr. and Mrs. Jarvis and daughter, Valerie, were also honored by the Ontario Plant Food Council at a dinner in the Royal York Hotel.

HONORS

Sterling R. "Bert" Newell, chairman of the U. S. Crop Reporting Board has been awarded the USDA Distinguished Service Award for "his vision and leadership".

Robert V. Peabody, Smith-Douglas general traffic manager, has been elected to a 2-year term as chairman of the Traffic Committee of NPFI, succeeding John S. Carlson.

Dr. Karl A. Folkers, executive director of fundamental research for

HONORS: agricultural division "stars" of American Cyanamid Company congratulate farm advisor John L. Quail (far left), Fresno County, Calif., as he receives Cyanamid's County Agent Award. Next to Mr. Quail are: B. F. Bowman, marketing director; H. E. Clark, western regional manager; H. H. Phillips, assistant western regional manager; and E. H. Smythe, assistant marketing director. The silver plaque award, the third to be presented by the company, is given to outstanding county agents in the nation. The event took place in Fresno, Calif., October 2.

Merck, Sharp & Dohme Research Laboratories, has been chosen over 25 other nominees for the Charles F. Spencer Award. This honor, founded by Kenneth A. Spencer of Spencer Chemical, in memory of his father, carries with it a medallion and \$1,000. The award is jointly sponsored by Spencer Chemical and the American Chemical Society. It will be presented to Dr. Folkers at the Fall chemical conference this month of the Kansas City Section, ACS.

Thomas Cox, American Cyanamid and **W. E. Valliant**, Dorchester Fertilizer, were re-elected chairmen of NPFI committees, respectively NE Research and Education; NE Industry Advisory.

D. P. Cranberry, Laurel Oil & Fertilizer Company, Laurel, Miss., was named to the board of directors of the Mississippi Manufacturers Association at the group's convention Oct. 15-17 at the Buena Vista Hotel in Biloxi.

Equipment News . . .

verting full engine power to the hydraulic system at a touch of the brake pedal.

The 5300 lb. carry capacity unit is available with 6 buckets ranging in size from 1 to 3 cubic yards. Buckets tip back 42° at ground level, and 47° when only 14 inches above the ground. Dumping clearance under bucket cutting edge ranges from 7 ft. 3 in. to 8 ft. 5½ in. At maximum dumping height, reach from the front of the tires to the cutting edge varies from 2 ft. 11 in. to 3 ft. 7 in. From the front of the frame, reach is 2½ in. greater.

For complete information on Model TL-14 TractoLoader, circle number 21 on CF's Information Service card, page 51.

Automatic Flame Photometer

An automatic flame photometer for sodium and/or potassium analyses that eliminates sample preparation and continuously records results has been announced by Technicon Instruments Corporation.

Up to the present time, conventional flame photometers involved taking a sample; modifying it by involved dilutions; and then feeding it to a flame. Characteristic light emissions were measured on a meter, translated by trained technicians to milli-equivalents from a calibration curve, followed by tabulation of results.

With the 'AutoAnalyzer' sample preparation is eliminated. The sam-

ple plate is loaded, and 40 samples are automatically diluted, purified by dialysis, and pumped into a flame unit. Quantitative measurements are continuously recorded on a moving chart.

The recorder operates as an integral part of the continuous flow system. It comprises a balanced-ratio system in which the unknown and standard samples passing through it are continuously measured against a fixed reference.

The new AutoAnalyzer Flame Photometer requires no human supervision. Sodium and potassium analysis can be run simultaneously or individually.

For further information, circle Number 22 on CF's Information Service card, page 51.

New Bearing Takeups

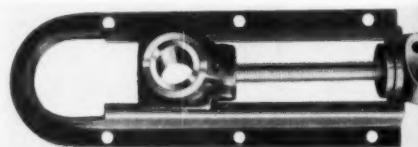
Link-Belt Company has announced the addition of 74 new sizes, in three new series, to its complete line of babbitt and bronze bushed bearing takeups. With the new additions the company now offers off-the-shelf delivery on more than 10 types and over 200 sizes of babbitted and bronze bushed bearing takeups for commercial shafting up to 5-15/16 inches.

The new sizes include: Series AS 2600Z bronze bearing takeups suitable for use on conveyors or elevators where service is moderate. They may be mounted vertically or horizontally on sides of casing or on supports. Frames of pressed steel assure maximum strength with minimum weight. Bearing blocks are mounted perpendicular to the base

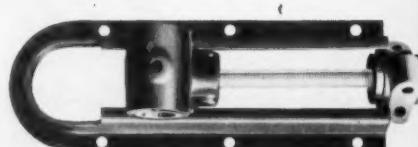
of the frame. Link-Belt added 24 new sizes in this series.

Series BS 2700Z bronze bearing takeups have the bearing blocks mounted parallel to the base of the frames. They are generally used on moderate duty conveyors and elevators and are usually mounted on structural supports. Link-Belt added 24 new sizes in this series.

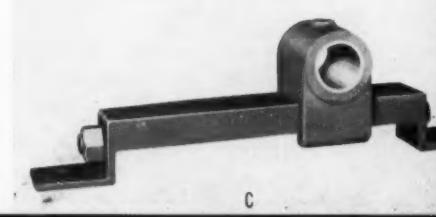
Series N 3000Z bronze bearing takeups are particularly adaptable for use on moderate duty chain or belt conveyors or other special



A



B



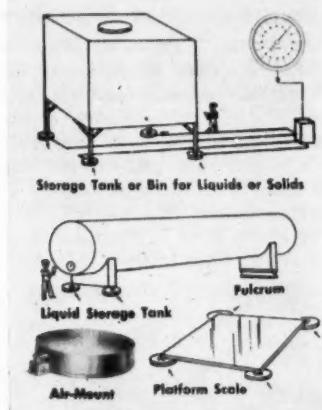
C

equipment. The rigid, compact, welded channel frames protect the screws and provide ample strength with minimum weight. The design allows maximum possible adjustment within limited installation space. Link-Belt added 26 new sizes to this series.

For complete information, circle Number 23 on CF's Information Service card, page 51.

New Weighing System

A new Weber 'Air-Mount' Weighing System for weighing contents of bins, tanks, truck tanks, conveyor or loads and also anything that can be weighed on platform scales is now available for loads covering the entire range from 0-300 lbs. to 0-200,000 lbs. National Bureau of Standards in Washington, D. C. has calibrated, tested and proved these



units to have a repeatable accuracy of better than 1/10 of 1%.

This new system is claimed to be quick and easy to install. No changes in floor construction or foundations are necessary. Complete equipment and installation for a 4-legged 30,000 lb. tank or storage bin or equivalent weighing problem can usually be obtained for less than 50% of the cost of conventional scales, the manufacturer states. Actual installation time is said to be ordinarily less than one hour.

The Weber Air-Weigh System is operated by a small load-cell placed under each leg of a tank, bin, conveyor section, platform, etc. Linear pneumatic pressure is automatically controlled in each load-cell and produces a pneumatic signal on a meter, which may be remotely located.

Literature is available by circling number 24 on CF's Information Service card, page 51.

Construction Materials For Fertilizer Plants

Chemical Construction Corporation is making available for limited distribution copies of a 50-page brochure on "Materials for construction for Fertilizer Plants and Phos-

phoric Acid Service." This is an exhaustive survey of the materials used in the handling of phosphoric acid solutions and slurries, exhaust gases containing entrained phosphoric acid and/or fluorine compounds, superphosphates, ammonium phosphates and ammonium phosphate slurries, and wastes contaminated with phosphoric, sulfuric and fluosilicic acids. Treated in the booklet are Ferrous Metals and Alloys, Non-ferrous Metals, Elastomers, Plastics, Carbon, Brick, Wood and other miscellaneous materials.

A tabulation of 150 different materials, groups and brand names is included for easy reference.

The thorough-going study of this brochure was the text of a paper presented at the American Institute of Chemical Engineers meeting September 30, 1959 at St. Paul, Minnesota, by Chemico's Project Engineer Enrico Pelitti.

To request a free copy, write on Company Letterhead to Chemical Construction Corporation, 525 West 43rd Street, New York 36, New York.

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NPFI SPONSORS CHEMICAL CONTROL CONFERENCE

A very successful conference on Chemical Control Problems, sponsored by National Plant Food Institute, brought together 125 men interested in these problems at Washington, D. C., October 15. Among these were many representatives of the fertilizer industry and state fertilizer control officials who had gathered for the Control Officials meeting the following day.

Sessions were conducted by Vincent Sauchelli, NPFI chemical technologist, and participants included a wide range of specialists from the industry, government and other agencies.

W. J. Youden of the National Bureau of Standards spoke on statistical methods for chemical analysts, and Edwin M. Glocker of W. R. Grace & Company's research center explained how to use data from the Magruder check sample statistical analysis.

A panel discussion on tolerance levels in chemical fertilizer analyses brought four men before the group.

H. J. Webb, chief chemist in the South Carolina department of fertilizer inspection and analysis, led off the panel.

F. W. Quackenbush, Indiana state chemist, cited chemical analysis records showing how most fertilizer manufacturers consistently over-formulate to avoid the stigma of deficiency penalties in the published inspection records.

Stressing the industry's need to improve the uniformity of its products, he described cases in which there is a thousandfold difference in the range of particle size in some mixtures. Sampling problems are greatest where both particle size and particle composition are different, he said, expressing doubt that a tool could be accurately designed to properly sample products which lack uniformity.

A. J. Duncan, statistician from Johns Hopkins University, said we need to think of quality in terms of a distribution rather than as a single figure, since we cannot ever think in terms of a perfect product. In industrial manufacturing, he stated, much quality control is based on a specification limit which considers the percent of units which are defective.

He illustrated standard deviations and tolerances with operating characteristic curves for the Miles-Quackenbush "Tolerance" Plan.

C. H. Perrin, research chemist for Canada Packers Ltd., discussed laboratory and methodic biases. These, he believes, would not be reduced greatly even if the number of samples were increased greatly. He said that every effort must be made to locate and eliminate laboratory biases, but admitted that methodic biases would present a greater problem, as there is no reason why methodic values should 'even out.'

He spoke of the high economic cost of trying to eliminate production variations, much less the accident and contamination errors which are bound to occur in even the most carefully controlled formulating unit.

Discussion which followed Mr. Duncan's talk pointed out the difficulty of fairly analyzing a product when there has been a change in the moisture content between the time of manufacture and time of analysis. These problems, it was pointed out, are especially troublesome when the materials become more hygroscopic, as high analysis goods tend to do. Some control of this error could be exercised by air conditioning of laboratories, but then there would be difficulty in setting a standard relative moisture level to be observed in all laboratories.

Robert Z. Rollins, chief of the Bureau of Chemistry for the California Department of Agriculture, described the relation of the state regulatory office to the local fertilizer

industry. The law, he pointed out, must be the framework on which this relationship exists. He said there was trouble in determining just where and when the manufacturer should be held responsible for his product, and these difficulties are increased by the use of liquid materials. California, he said, conducts its sampling anywhere in the channels of trade, and inspections run one for each 384 tons of materials reported. A breakdown of these samples showed that 7% were sampled while in the hands of the registrant, 25% en route (in the dealers' hands) and 68% of the samples were obtained after the material had reached the purchaser's hands. Individual rates of sampling depend greatly on the history of the material and of the registrant.

Mr. Rollins pointed out that the California control office would like to analyze samples only for total nitrogen, but the industry continues to want a breakdown into forms of nitrogen. He pointed out that one-tenth of all nitrogen deficiencies found in California control work were in the form of nitrogen found, and not in total nitrogen content.

Nelson White, vice president of International Minerals and Chemical Corp., spoke on "How Management Regards The Role of The Chemical Control Laboratory." Describing the control laboratory as the connecting link among research, production and sales, he told how it can protect the firm's most precious asset: company reputation and brand name. Mr. White also discussed the relationships of state inspection, cost control and market price of fertilizer goods.

John Brebson of Tennessee Valley Authority's chemical development division, concluded the program, speaking on "How Firm the Foundation."

FERTILIZER CONTROL OFFICIALS ELECT



New Officers, executive committee. Front Row: President Stacy Randle, New Jersey; Executive Committee Chairman, Ernest Epps, Louisiana; R. C. Wetherell, Montana. Back row: Vice-President Charles Marshall, Canada; retiring President F. W. Quackenbush, Indiana; Secretary-Treasurer Bruce Cloaninger, South Carolina; Robert Gunter, Kansas; and Floyd Roberts, Arizona.

Fertilizer Control Officials Elect Randle

Stacy B. Randle was elected president of the Association of American Fertilizer Control Officials, meeting at Washington, D. C. October 16. Charles Marshall of Canada was chosen as new vice-president of the group, and perennial Secretary-Treasurer Bruce D. Cloaninger of South Carolina was reelected to this position.

Robert Guntert, of Kansas, was elected to the Executive Committee, and R. C. Wetherell of Montana, was named to another term on this body. Hold-over members are Ernest A. Epps, Jr., of Louisiana, who was reelected chairman of the Executive Committee, and Floyd Roberts of Arizona. Retiring President F. W. Quackenbush joined the Executive Committee as an ex-officio member.

Attendance at the meeting was 142, with 79 control officials representing 44 states; 42 fertilizer in-

dustry representatives were on hand for the sessions.

In his secretary-treasurer's report Mr. Cloaninger stated that 14 states have during the past year either changed or initiated some change in their fertilizer legislation. A number of others have adopted the uniform tonnage report as a guide for their own reporting activities, and cooperation between control officials working through the Association has kept a number of undesirable products off of the market.

In his President's message, Dr. Quackenbush clearly outlined a very positive program which the Association and the industry should strive toward. He said that control officials had a responsibility to gather and compile information on changes in fertilizer use; every state should compile classified tonnage information at least twice a year and make it available promptly to state and

Federal government agencies and to the fertilizer industry.

They also must exert a concerted effort to prevent evasion of laws under the guise of custom mixing of plant foods. In this field there is a legitimate area of operations, he admitted, but also an illegitimate area of operations. Officials cannot close their eyes to the unfair competition of unlawful mixing while insisting that plant food manufacturers over-formulate to meet guarantees. In this competition he said that the states as well as the industry should make it clear that differences exist in the products, as a matter of fair competition.

The plant food industry needs to step up research on the chemistry and technology of plant food production. Manufacturers are no longer simply a mixer of stable materials, but processors of chemical compounds—and as a chemical industry are subject to the evolution typical of chemical industries. The fact that this is a low profit industry is limiting, he granted, but the industry cannot afford not to meet this challenge.

To obtain better agreement in analytical results between laboratories, chemists in both state and industry labs need to conform more closely to standardized procedures. There is no place for using one's own methods and short cuts, he emphasized. Magruder check samples under the expanded program will provide special samples which should give more exact information on the extent of variation between laboratories. An effort is also being made to obtain a supply of standard



STAFF
PICTURES

STAFF PICTURES

1. Bob Moncrief, Georgia; E. W. Constable, North Carolina; George Suggs, Allied Chemical Corp., New York.
2. Walter Scholl, USDA, Beltsville; Bob Rollins, California; and Allen Baker, Washington.
3. Murray McJunkin, U. S. Steel, Pittsburgh; Bert Tucker, Sohio Chemical Co., Lima, and J. R. Adams, USDA, Beltsville.
4. Bob Crooks, Florida, and K. G. Clark, USDA, Beltsville.
5. Bob Church, du Pont, Wilmington; Henry Klosky, Baugh & Sons, Baltimore; George McGrew, Miller Chemical Co., Baltimore.
6. John Mahan, Commodity Stabilization Service, Washington; W. F. Watkins, Washington; K. D. Jacob, USDA, Beltsville.
7. Gene Triggs, Mississippi; J. R. Mays, Jr., Tennessee, and Ernie Epps, Louisiana.
8. Jack Slater and Parks Yeats, Oklahoma.
9. Maurice Rowe, Virginia; W. L. Baker, Missouri.
10. Chuck Everhart, U. S. Industrial Chemicals, Danville, Ill., and R. M. Ludwig, American Agricultural Chemical Co., New York.
11. Bruce Poundstone, Kentucky; J. D. Patterson, Oregon.
12. Joe Reynolds, Davison Chemical, Baltimore; Charlie Floyd, Virginia-Carolina Chemical, Richmond.
13. Dale Kieffer, Smith-Douglass, Norfolk; M. D. Sanders, Swift & Co., Chicago.

chemicals of high purity and known composition for individual laboratories to use as a check on their overall procedures.

The industry needs to improve the uniformity of its product and to cut down on overformulation. More homogeneous goods will result in less sampling trouble.

There is a serious need for thorough study of the basic physical facts underlying segregation of plant food mixtures. We need to know the physical limits of particle size and shape that can be tolerated without serious segregation, in handling from conveyor belts, in formation of large and small cones in storage bins, in handling of bulk piles prior to bagging, and in filling bulk trucks before delivery.

The Association of Official Agricultural Chemists will have to move fast to keep pace with its work on methodology, he prophesied. Extensive changes have been made in the past decade to keep abreast with analytical demands: nitrogen and potassium methods have been completely worked over, phosphorous methods have been improved, and new sample techniques have been studied, along with work toward reduction of sample size. In addition, statistical tolerances have been developed. But it is only realistic to expect at least as many changes in the years ahead.

Dr. Quackenbush also suggested consideration of changing the name of the Association of American Fertilizer Control Officials. Since the officials do not now really "control" the fertilizer industry, he questioned the value of retaining this word in the Association name. As more major industry associations and individual firms change their name from "Fertilizer" to "Plant Food" he speculated that the Association might consider changing its name to conform with this trend. As a proposal, he offered "American Plant Food Officials" or "Plant Food Officials of America."

Efforts should be pushed, Dr. Quackenbush said, to express phosphorous and potash as the elements rather than as the oxides. Agronomists are anxious for the change, he pointed out, and the Control Officials have provided the pattern for enabling legislation in their uniform fertilizer bill. To the industry, which has resisted the change for the most part, he said "Eventually, why not now?"

In conclusion, the president sug-

gested consideration of a change of future meeting places. The officials can hardly do their best at their annual meeting after a full week of other meetings, and may be trying to accomplish too much in too little time. In addition, there is conflict between the feed control meeting and the National Plant Food Institute chemical control conference, he explained.

Admitting that there would probably be many differences in viewpoint regarding his proposed program, Dr. Quackenbush stated that there was no progress without thought and discussion, and the presentation's purpose was to stimulate both.

Dale C. Kieffer of Smith-Douglass Company spoke to the officials on in-plant shrinkage. This problem was given little attention prior to 1950, as industry relied on a standard 2% up until that time, he said, but drastic changes in materials—especially nitrogen, more concentrated materials in all primary elements, and the trend to granulation—increased the number of holes through which materials leaks were developing. He outlined intentional losses and unintentional losses in plants and told how information was being gathered and tabulated to study this problem.

Maurice B. Rowe discussed IBM equipment for tonnage reports, and stated that of 16 states currently compiling county figures on an annual or semi-annual basis, six are

using this equipment for processing the data. Those not compiling data by county will find that agricultural colleges, county agents, and the fertilizer industry can make excellent use of the material, and it will also give the control official a check on tonnage fees, he emphasized. The invoice reporting method provides destination information on shipments, Mr. Rowe said, and helps the inspection program and assignment of inspectors to areas. For the most value, he recommended distribution of the data in 30 days. IBM processing equipment is fast and accurate, he stated, with either a cost comparing very favorably with the cost of present methods, or the possibility of more data at the same cost.

Robert C. Crooks, of Florida, talked about analytical reports. Florida has found that industry wants a complete statement of the results on samples where one element fails to meet the specifications, but he felt that analytical reports could be abbreviated when all guaranteed elements met specifications.

Dr. A. J. Duncan, of Johns-Hopkins University, spoke on some observations of the NPFI chemical control research project. He discussed varying results of samples obtained with different sampling tubes, and evidence of laboratory variations in determinations of plant nutrients.

Most of the afternoon session was devoted to committee reports. Some of the highlights of these reports were that there is some type of activity in 23 states to amend or change fertilizer legislation, and that more and more states are becoming concerned with hazardous materials.

As for the uniform tonnage reports, 14 states have adopted the uniform report 'as is' and another 15 states have adopted essentially 'as is' and several other states are planning adoption. As for issuance of quarterly reports, 16 states are currently issuing—or will issue—these, and two more expect to adopt this system. Twenty-two others are using or will use semi-annual reports, and quarterly reports are still far in the future for most of these.

On the evening preceding the meeting, the control officials held their states relations committee session. Topics discussed dealt principally with custom mixing and bulk blending, and where these practices fitted into the state regulatory picture.

County Agents "Pastors of Land"

County agents—"pastors of the land"—can help ease one of the underlying causes of world tension, according to B. F. Bowman, American Cyanamid's agricultural division.

At ceremonies honoring Fresno County farm advisor John L. Quail (see Honors) Mr. Bowman said that agriculture and distribution of its products are a cause of tensions.

County agents spearhead the battle to reach men's minds in countries seeking to feed and clothe their populations. These "have nots" are natural for political exploitation.

"Pastors of the land, devoted to teaching the religion of the soil . . . are the forerunners of a great host of men and women who will go out from America . . . to lead men of other lands to conquer their own problems of need and want."

California Convention November 9-11

The thirty-sixth annual convention of California Fertilizer Association will be held at the Fairmont Hotel, San Francisco, November 9-11. Thomas Fleischman of St. Regis Paper Co., San Francisco, chairman of the convention Program Committee, said that featured speakers will include Dr. Russell Coleman of National Plant Food Institute.

The business meeting will also feature reports by CFA President Howard H. Hawkins, Golden State Plant Food Co., Glendora; General Manager Sidney H. Bierly, Sacramento; Millard E. McCollam of American Potash Institute, San Jose, chairman of CFA's Soil Improvement Committee.

On the morning of November 11, there will be a panel discussion about "Technical Progress and Business Stability". Panel Moderator will be R. L. Luckhardt, Vice Chairman of the Soil Improvement Committee, of Collier Carbon and Chemical Corporation, Los Angeles. Members of the panel will include Floyd Hornibrook, The Best Fertilizers Company, Lathrop; Dr. Guy F. MacLeod, Sunland Industries, Fresno; Dr. Malcolm H. McVickar, California Spray-Chemical Corporation, Richmond; Larry M. Roberts, Shell Chemical Corporation, San Francisco; James F. Sloan, J. F. Sloan Company, Salinas; and William E. Snyder, Wilbur-Ellis Company, Los Angeles.

The afternoons of the 9th and 11th will be free from any organized program.

Assisting Mr. Fleischman and his Program Committee in development of program and entertainment are committees headed by Mrs. A. L. Diebolt, Los Altos; and Robert E. Segerdell, Hercules Powder Company, San Francisco.

South Dakota Dealer Program

The South Dakota State College Dealers Program will be held January 26-27, with a banquet scheduled for the final evening, according to Dr. Paul Carson.

Wisconsin Lime and Fertilizer Day Jan. 25

On the first day of the Farm and Home Week at the University of Wisconsin, the annual Lime and Fertilizer Day will be held there, January 25.

Fertilizer Solutions Meeting November 8-10 at St. Louis

Program Calls for Study of Solutions and Suspensions, Green Acids, Formulations and Corrosion

Featuring a "solutions equipment style show" and a series of talks by recognized authorities, the National Fertilizer Solutions Association is meeting November 8-10 at the Statler Hilton Hotel in St. Louis. An unusual feature is an old time-melodrama on the last surviving river show-boat.

At the equipment style show suppliers who have exhibit rooms at the convention will highlight principal features of their products and answer questions from the audience.

Features of the initial morning program November 9 are the President's address, a presentation captioned 'New Use for Your Most Important Product,' and a talk on 'Why Are You in Business?'

At the general session the following day, there will be a group of top authorities on liquid fertilizer topics bringing the convention news of latest developments in their specific fields.

W. S. Newsom, Jr. of International Minerals & Chemical Corporation's research engineering and development division will lead off the subject of 'Solutions and Suspensions.' Edgar W. Sawyer, Jr., research supervisor for Minerals & Chemicals Corp. of America will join in on the same topic.

A speaker from Allied Chemical's General Chemicals Division will talk on 'Green Acids.' H. H. Tucker of Sohio Chemical Co. will speak on 'Formulations,' and Murray McJunkin of U. S. Steel Corp. will talk about 'Corrosion.'

Spencer Chemical's J. E. Tuning will talk on Nitrogen, Monsanto's James L. Brown on Phosphates, and U. S. Potash's Edwin C. Kapusta on Potash.

To lead off the afternoon session on the final day's program, Robert A. Lemler will moderate a Town Hall meeting panel on 'What's Bothering You?' Panel participants will include half a dozen prominent liq-

uid fertilizer manufacturers from widely scattered sections of the country: Nelson D. Abell, Edwin C. Aylward, E. E. Crouse, L. T. Stone, Edward A. Wex and Morris Wooley.

Indiana Conference December 2-3

From Russell K. Stivers, associate professor of agronomy, Purdue University comes word that the Memorial Center at the University, Lafayette, Indiana, is to be the scene of a fertilizer conference on December 2-3.

Minnesota Short Course Dated December 7-8

The University of Minnesota soils department announces that its annual soil and fertilizer short course will be held December 7-8 on the campus in St. Paul. The Minnesota Fertilizer Industry Association will hold a meeting the afternoon of December 8, following adjournment.

Georgia Society a Constructive Force

Recent news of the activities of the Georgia Plant Food Educational Society shows how important a factor this Society is in its state and how vital such associations can be in each state in the Union.

Teaming up with the University of Georgia, NPF and various fertilizer concerns operating in the State, GaPFES has sparked a dollar increase in crops for 1958 over 1957 which included \$20,000,000 for corn; \$4,000,000 for cotton; \$9,000,000 for tobacco and \$14,000,000 for peanuts . . . a total of \$47,000,000.

The Society has just released information about two new publications, helpful to the industry through education to the farmer . . . part of a series issued over the years. One is "Lime for More Profits." The other is a map showing the 31 counties continuing soil fertility and corn programs, and the 22 counties initiating soil fertility programs for the new season.

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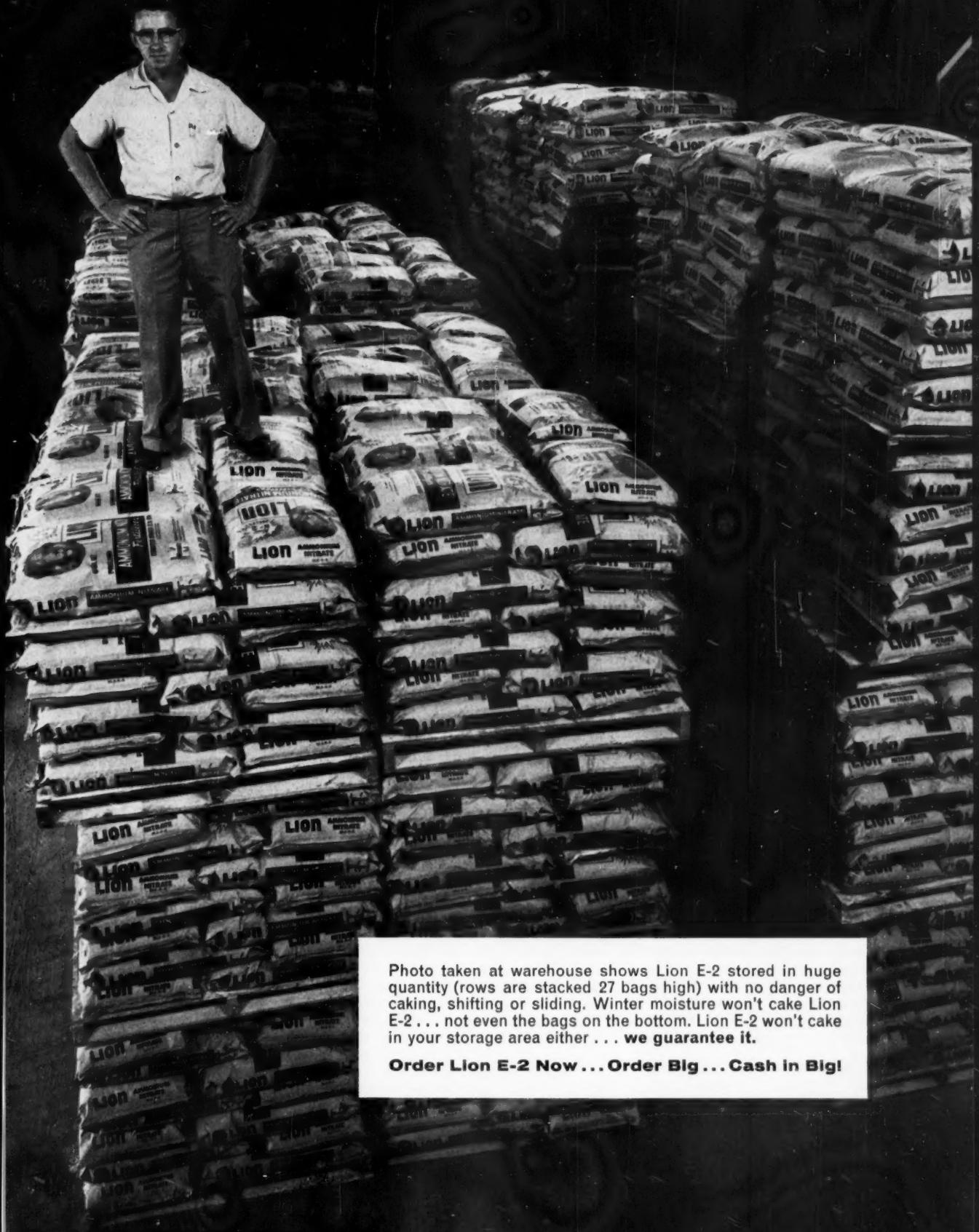


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FOREST

(Continued from page 26)

discussed grazing management on pine forest land. "There are about 19 million acres of land in the yellow pine areas of Oregon and Washington suitable for livestock grazing," Mr. Currier stated. In this area timber production is of prime importance and any use for grazing should be concurrent with good tree management. He showed slides illustrating the use of a new range seeding and fertilizing unit they had used in various areas. "We have found that the use of fertilizer has been essential to obtain proper establishment of grass on new plantings in this area.

S. P. Gessel and Ed Bailey, research foresters at the University of Washington reported on the economic aspects of Douglas fir fertilization. Their data indicated that an economic return had been obtained by applying from 100-200 pounds of actual N on site 5 land at Pack Forest, Washington. The cost return ratio tables indicate a maximum return of \$3.00 for every \$1.00 invested, at 3% compound interest. The data indicated that the increased growth rate of fertilized stands can upgrade site and reduce rotation age for pulpwood and sawlog species.

NORTHEAST

(Continued from page 38)

million people who must be fed and otherwise provided for. Perhaps I should explain that by the Northeast, I mean the six New England states, the additional six states of New York, Pennsylvania, New Jersey, Delaware, Maryland and West Virginia. In addition, much of the state of Virginia and the eastern half of Ohio are a part of this Northeastern region. The future of Agriculture and of livestock in the Northeast appears to depend upon the efficiency with which we produce with our soils, our climate, and our proximity to market. Can we produce the things that our people need, and deliver them at a lower cost than will be true if those products are produced somewhere else and shipped in? Unless feed can be produced more economically and of better quality from local resources, then we could not say that the Northeast has a great potential."

"It appears that the further development of dairy, beef, and sheep will be the direction in which livestock farming could and should go

in the Northeast. The problem centers around the question of whether livestock production in the Northeast should be based on local feed supply, or whether it should be based on feed produced somewhere else and shipped in.

"Forage already is a dominant factor in our agriculture.

"New York State farmers in the last census spent 27 million dollars to buy commercial fertilizers and 3.8 million dollars on lime, totaling about 31 million dollars. In the same census, the farmers of New York State reportedly spent 172 million dollars for grains and concentrate feeds or about five and one-half times as many dollars for feed as for lime and fertilizer.

"A ton of milk can be produced from home-grown grain for \$25.00, but that same ton of milk produced from purchased grain totals \$34.00. In other words, good forage will produce milk at very greatly increased savings, or at lower cost per unit of milk, than such milk produced from purchased grains.

"Although the data quoted are from New York State, there is clear evidence that the same situation exists for Pennsylvania, and for each of the other Northeastern states. It is not a peculiarity of any one state.

"There is abundant evidence as to the possibility of greatly increasing the yield of forages in the Northeast and also increasing the nutritive value at the same time. We can easily double the hay yields that are now being produced on most farms in the Northeast, and this would include the application of enough lime to correct soil acidity, sufficient fertilizer of the right kind to satisfy the needs of the forage crop, and then handling the forage crop so as to get this feed properly harvested and fed to the livestock.

"We believe that not only can we greatly increase yields and quality, but that by so doing the margin of profit above actual cost rises rapidly as the yield and quality rises.

"One of the very interesting aspects of lime and fertilizer use on farms today is the fact that nearly all of it goes into the grain crops, or such intensively farmed crops as potatoes. The hay crops generally are produced on the fertility carried over from those other crops in the rotation. When it comes to the permanent pasturelands that do not normally enter into rotation, we find comparatively little lime and fertilizer now being used. Consequently, these pasture fields are not now

producing very much feed and the feed itself is not of high quality. We have abundant information on the production possible by the adoption of our information on lime, fertilizers, improved forage plants, their management and harvest, and the use of the forage produced. We do have the capacity to produce abundant forage of good composition in the Northeast, not only on the land now tilled but also on the million acres of permanent grassland in the region. In short, there is no obstacle when it comes to our present knowledge of what we can do, with our land and soil, our climate, and the kinds of plants that can produce feed for livestock."

His final remarks should be taken deeply to heart by our industry:

"In conclusion, I must say that while we have a very promising potential in the Northeast for producing livestock, particularly dairy, beef, and sheep, to meet the needs of our present population, the additional millions of people as they arrive, nevertheless when we measure our past performance in the way of modernizing agriculture and making full use of our resources, then the outlook is far from being certain. The degree to which we realize the potential will depend on the extent to which businesses and industries serving agriculture are willing to take aggressive action in determining how better to do the job which they need to do in order to be an asset to the region, as well as a successful business or industry."

The conference was concluded by a discussion and a panel. Arthur J. Wells of GLF's seed and soil building department talked on the Five-Star forage demonstration program conducted by GLF which has been so successful in helping farmers who have worked with GLF on it. The panel was conducted by the morning's speakers, answering questions from the floor.

Cyanamid Schedules Regional Sales Meetings

The agricultural division of American Cyanamid Company announced its schedule of regional sales meetings, the first two scheduled for late last month.

Dates and locations of the meetings are: Northeast region, Cherry Hill Inn, Haddonfield, N. J., Oct. 26-27. H. H. Phillips, regional manager; Southeast region, Riviera Hotel, Atlanta, Ga., Oct. 29-30. C. W. Cook, regional manager; Midwest region, The Wagon Wheel,

Rockford, Ill., Nov. 5-6. John Howard, regional manager; Southwest region, Sheraton Hotel, Dallas, Texas, Nov. 5-6. Ira Sturkie, regional manager; and Western region, Hacienda Hotel, Fresno, Calif., Nov. 9-10. Hamilton Clark, regional manager.

W. Va. Pulp & Paper Realigns Sales Districts

West Virginia Pulp and Paper Company has created a new sales office to be known as the Middle Atlantic sales district, it was announced by Jason M. Elsas, regional manager, multiwall bag division.

The new sales office will cover the states of Maryland, Virginia, North Carolina and South Carolina.

Mr. Elsas said that H. Lockwood Frizzell, formerly a sales representative for the division, has been promoted to the position of district sales manager for the new sales district, which will be headquartered in Charlottesville, Virginia.

Other sales districts, Mr. Elsas said, have been realigned and renamed as a means of better describing the territories covered.

The district headquartered in Atlanta, Ga. under the direction of H. M. Howe has been designated as the

Southeastern district. It consists of four sales representatives who will serve customers in the states of Tennessee, Kentucky, Alabama, Georgia and Florida.

The sales district centered in New Orleans will be known as the Southern district and will include the states of Louisiana, Arkansas, Mississippi, New Mexico, Oklahoma and Texas. L. J. Even is district manager and has a staff of six sales representatives.

The former Dallas district has been absorbed by the Southern district; however, an office will be maintained in that city for the convenience of customers.

The district headquartered in Torrance, Calif., which is headed by F. L. Smith, will be known as the Western district. A staff of seven salesmen will serve multiwall customers in the states of Arizona, California, Colorado, Idaho, Nevada, Oregon, Utah, Washington, Wyoming and the western half of South Dakota.

Jason M. Elsas is regional manager for the multiwall bag division responsible for the New Orleans and Torrance operations. Sheldon Y. Carnes is regional manager responsible for the division's operations at St. Louis, Mo. and Wellsburg, W. Va.

Armour Announces New Divisions, Executives

A major organizational realignment of Armour Agricultural Chemical Co. has been announced by W. E. Shelburne, president of the firm with headquarters at Atlanta, Ga.

The company is being organized into two major divisions, Fertilizer and Nitrogen-Phosphate. The Fertilizer division will include Armour's 27 complete fertilizer manufacturing plants in the U.S., one in Cuba and one in Puerto Rico. The Nitrogen-Phosphate division will include Armour's newly-acquired nitrogen plant in Crystal City, Mo., a triple superphosphate plant at Bartow, Fla., and phosphate mining and processing facilities at Bartow and at Columbia, Tenn.

H. Vise Miller was named vice president and general manager of the Fertilizer Division. Robert L. James was appointed vice president and general manager of the Nitrogen-Phosphate Division. Bernard M. Machen became sales manager of the Nitrogen Division at Crystal City. John E. Moore was named assistant to the president.

Mr. Miller, former vice president and general sales manager, joined Armour in 1923. Mr. Machen was assistant sales manager for Mississippi River Chemical Co. when Armour acquired their plant. Mr. Moore, who joined Armour in 1939, was previously assistant general superintendent.

-of This and That...

— Won as a first prize was a Lawn Boy power mower in the Lilly's Fertilizer caption contest. The prize winning caption was: "You'd never been caught with your 'Plants Brown,' if you'd used Lilly's Fertilizer."

— Dateline Sheffield Lake via Elyria, O. "The Sheffield Lake Jaycees fall fertilizer sale is now under way and order blanks are being distributed by Jaycee members. Orders will be taken until Oct. 14 with all deliveries to be made to the home Oct. 17th. Advice will be given on the use and amounts needed if requested at the time the order is taken . . . Proceeds of the sale will be used for the various community projects in the Village, sponsored by the Jaycee organization. The spring and fall fertilizer sales are the major fund raising projects of the year." (Funds for the fertilizer industry, too.)

— "Fertilizing without a soil test is like taking medicine without a prescription"—A quote from the Edgerton Enterprise, Edgerton, Minn. It's a good line to use.

NPFI HONORS KING
Ray L. King, president and general manager of the Georgia Fertilizer Company, Valdosta, was honored at the recent Southeastern Fertilizer Conference in Atlanta, when he was presented a scroll in recognition of his leadership and contributions in the field of agriculture, to the fertilizer industry and to the National Plant Food Institute.

The scroll, authorized by the Board of Directors of NPFI, of which he was a former member, was presented by Dr. Russell Coleman, executive vice president.



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WANTED—Manager for large fertilizer plant—North Midwest Area—Plant is large granulation plant with superphosphate facilities. Give complete resume of age, education, experience and availability in first letter. Box 34, % Commercial Fertilizer, 75 - 3rd St., N. W. Atlanta 8, Georgia.

MANUFACTURERS REPRESENTATIVES — Manufacturer of a nationally advertised line of water soluble fertilizer concentrates, needs representatives for Ohio, West Virginia, Michigan, and Illinois. A proven quality product with consumer acceptance. Protected territories, top commissions. Clover Chemical Co., P. O. Box 10865, Pittsburgh 36, Pa. Please state full details, lines handled and territory covered.

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POSITION WANTED — Manager or Superintendent. Thirty years experience fertilizer and superphosphate. Installed and operated mixer sulphuric acid system of granulation. References furnished. Box #36, % Commercial Fertilizer, 75 Third St. N. W., Atlanta 8, Ga.

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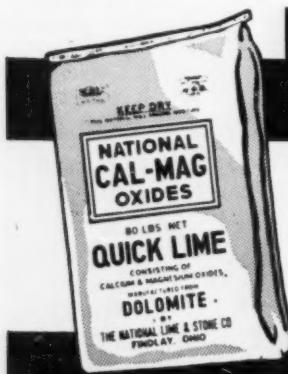
FOR SALE—1 New Stedman Type BX 20 x 18 Hammermill equipped with 4 row rotor with $\frac{1}{8}$ " manganese hammers and complete with 220V reduced voltage type compensator. Mill direct connected to 20 HP, 1200 RPM, 220/440 Volt, 3 Phase, 60 Cycle Totally Enclosed Fan Cooled Motor. Mill and motor mounted on integral base. Box # 20, % Commercial Fertilizer, 75 - 3rd St., N. W. Atlanta 8, Georgia.

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RESEARCH

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Bark as Mulch

Woodwastes, such as sawdust and bark, combined with N & P can be effective as mulches to retard erosion, hinder weeds, reduce water evaporation and influence soil temperature, says the Oregon Forest Products Laboratory.

OBITUARY

Elmer D. Young, 60, a director of Tri-State Chemical Co., Henderson, Ky., October 21 at his home in Lyndon, Ky., following a heart attack. A former vice president and treasurer of Tri-State, Mr. Young had sold his interest in the firm last July, but remained as a board member and had attended a board meeting on the day of his death.

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